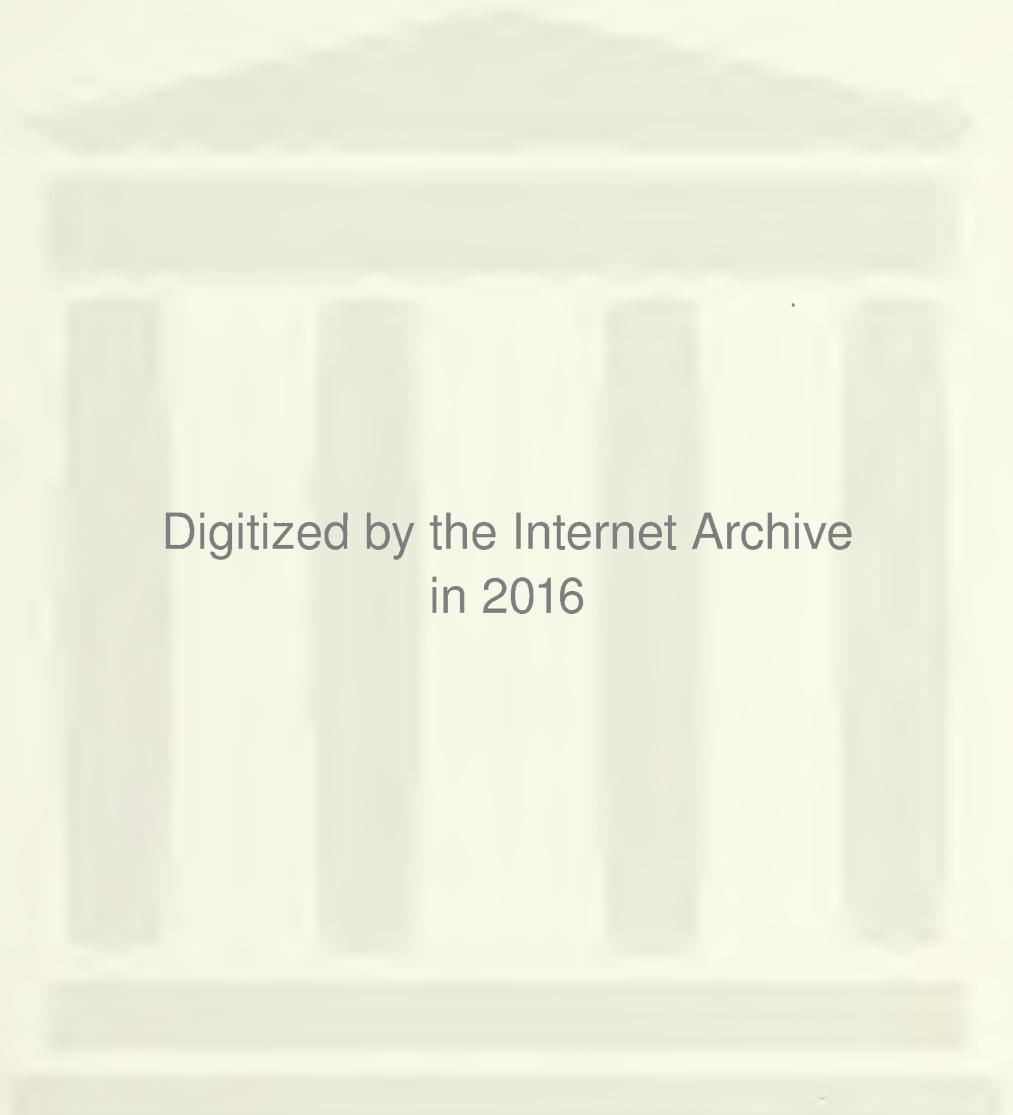


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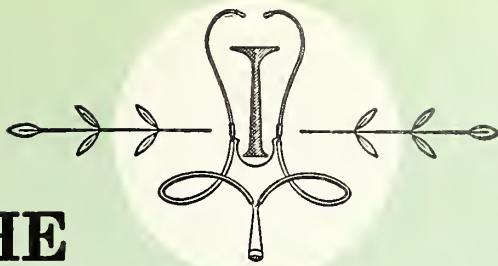


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The JOURNAL of the KANSAS MEDICAL SOCIETY

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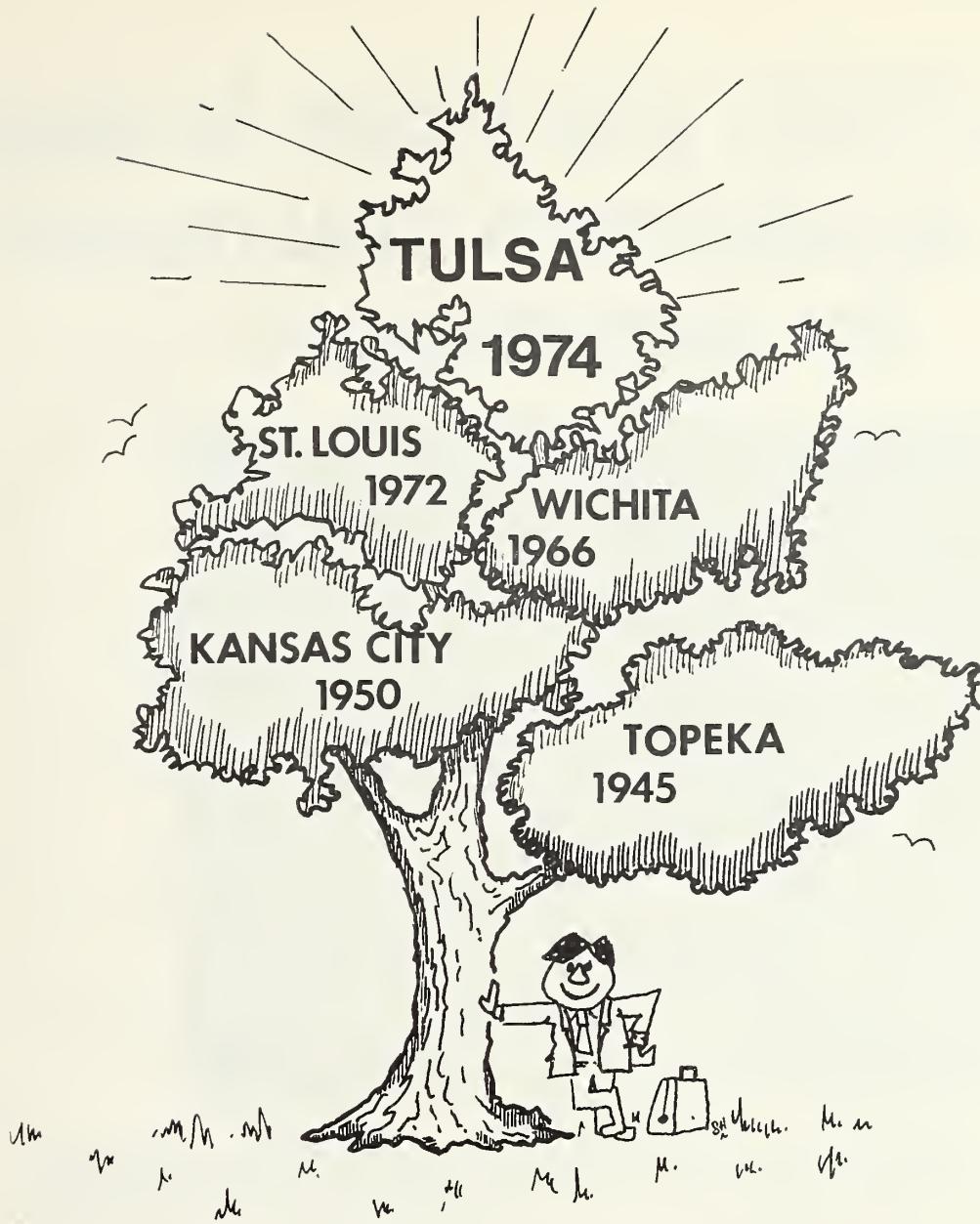
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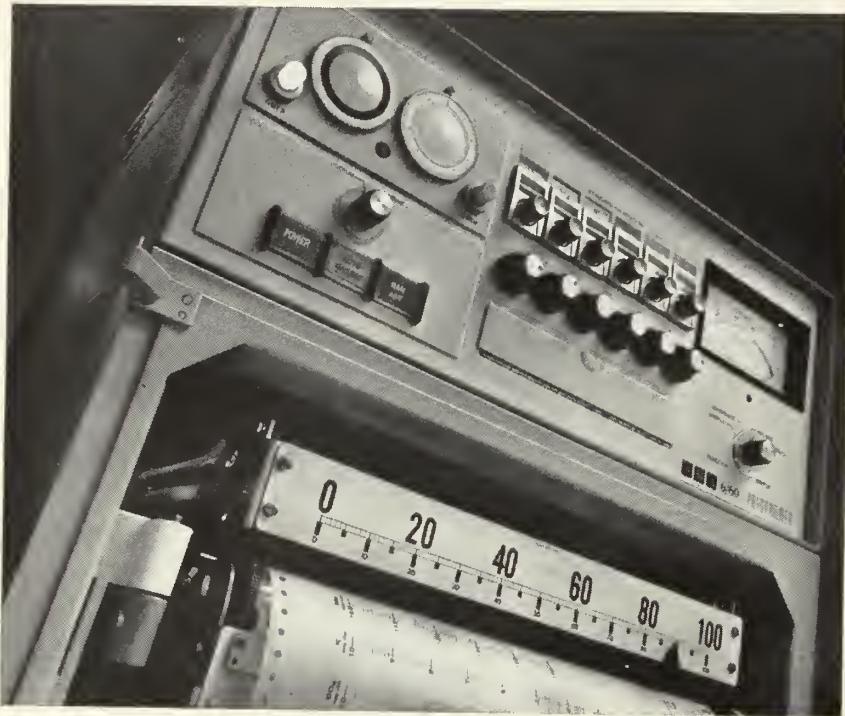
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Opinion & Dialogue

Is there a need for a drug compendium?

A drug compendium of the type I envision would fill a definite need for the practicing physician. Such a compendium would give him all the information necessary for using a drug intelligently, and it would do so in a clear, concise, convenient, objective and balanced fashion.

What a Compendium Should Contain

I believe the compendium should inform the doctor what a drug will do, when he should use it, for what type of patient, for how long, in what dose, what benefits his patient is likely to obtain, the risks involved, and cross-reactions with other drugs.

The information would be based on the package insert and have the same legal status. In fact, a complete compendium with complete and current information might even eliminate the necessity

Government Health Official

Henry E. Simmons, M.D.
Deputy Assistant
Secretary for Health
Department of Health,
Education and Welfare



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A drug compendium, or preferably compendia, should, I believe, be private, not federal, in sponsorship. They should contain comprehensive listings of drugs available for prescribing. They should be single, legibly printed volumes of reasonable size, updated quarterly or semiannually and completely revised every year.

Function of a Compendium

A compendium should furnish the following information on drugs in the following order: indications for use, side effects, adverse drug reactions, contraindications, drug interactions, drug dosage and the dosage forms marketed. Drug prices should not be included because they vary so widely and change rapidly.

No compendium should set forth drugs of choice or discuss relative efficacy. Such questions must be left for the practicing physician to decide, whether on the basis of the medical literature, his own clinical experience, advice of colleagues, information supplied by manufacturers, and so on.

Nor should a compendium undertake to educate the doctor on how to use drugs. Rather, it must be a reference source designed primarily to refresh his memory as to drugs he may not use regularly. It

or a package insert in many instances. This would constitute a substantial saving for the manufacturer.

By a complete compendium, do not mean a volume of prohibitive size. You don't need a book describing 25,000 products with an enormous amount of repetition. Rather, drugs should be arranged by class. Mutually applicable information would be provided, along with brief discussions pinpointing differences in specific drugs of that class. Listings would be cross-indexed in a useful way.

Other Available Documents as Sources of Information

Existing references such as PDR and the AMA Drug Evaluation are obviously useful but they are incomplete. Either they are not cross-referenced by generic name and do not group drugs with similar characteristics, or they do not list all the available and legally marketed drugs. And some of those omitted may be very useful.

On the other hand, drugs made by more than one supplier, tetracycline for example, may be fully described a dozen times in the same book.

While perhaps PDR could be rearranged and cross-indexed with generics included, and while the AMA Drug Evaluation might also be modified and expanded, I am not sure that the end result would have all the attributes required for a useful compendium. At the same time, you would run the risk of amassing a voluminous and unwieldy tome.

Should Editorial Comments Accompany the Listings?

Subjective judgments, in my opinion, have no place in a compendium. However, if there is substantial evidence based on a sound body of science concerning relative efficacy of several drugs, certainly that information should be included. The committee of experts compiling and editing a particular section would also have to assess

and indicate instances where a meaningful difference between drugs is pertinent.

Sponsorship, Compilation and Editing

Producing a book like this would undoubtedly be difficult and demanding. It would obviously take a great deal of talent and expertise, and would require a varied and experienced group, ranging from writers and editors to highly skilled clinicians and pharmacologists. Style, format and clarity of language would play an important part in determining the usefulness of the book. And it should be updated periodically and completely revised annually.

I have no opinion whether the government or the private sector should sponsor and/or finance the compendium. What is most important is that the compendium be an authoritative, objective and useful source of information for the doctor to have at hand as a ready reference.

should in no way imply control over the practitioner's prerogatives.

Why Another Compendium?

A practicable, single-volume compendium cannot, nor is it necessary to, include all drugs on the market today. From my practice of internal medicine for some 15 years, my experience as a consultant, and as a faculty member of four or five medical schools, I would estimate that a doctor uses only 30 to 35 drugs regularly. The 1972 Physicians' Desk Reference, incidentally, contained about 2,500 entries.

As to whether there should be a federal compendium, in my opinion, as stated earlier, the answer is easy—there should not be one. The proposal assumes that existing compendia are inadequate. We're not sure of that at all. Whatever its imperfections, the present drug information system in the U.S. is open, multifaceted, pluralistic and extensive. Good compendia exist, as well as other ample sources on drug therapy, ranging from journal literature through AMA Drug Evaluation to company materials. Not all physicians may use such sources as often or as well as they should, but that is the fault of the man, not of the sources.

In any event, rather than pro-

duce another book, it makes much more sense to work on improving existing compendia, and perhaps they could, as knowledge advances, include more accumulated clinical data and experience, and more information on drug interactions and adverse reactions.

Implications of a Federal Compendium

Take a hard look at the implications of a federal compendium. It would have the force of law, virtually dictating what drugs to use and how to use them. In effect, it would be a regulatory document with legal or quasi-legal status, posing medical/legal problems similar to those the doctor may now encounter if and when he departs from the provisions of the package insert. A compendium under federal aegis would tend to restrict decisions on drug therapy to one orthodox level—a most dangerous trend for medicine.

New Compendium—A Medical Option

I detect no ground swell of initiative or support whatsoever for a federal compendium—or, for that matter, for a new compendium of any type. A 1969 PMA survey conducted by Opinion Research Corporation found that only 15 per

cent of those physicians interviewed felt a new compendium was needed. And a large majority did not favor the involvement of the federal government if one were to be created, preferring instead a nongovernmental consortium.

Even if we come to a time when the medical profession itself opts for a new kind of compendium, it should be handled and financed, ideally, outside both government and industry. Final review and editorial authority could be delegated, say, to specialty bodies and medical societies—but above all, *not* the government.

Surely the health care system in the United States has far more vital matters to consider than the extensive cost and effort that would have to go into the preparation and maintenance of a new, monolithic compendium, and especially one bearing the imprint of the federal government.

Opinion & Dialogue

What is your opinion, doctor? We would welcome your comments.



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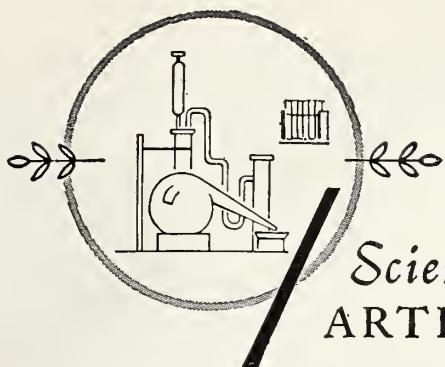
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Scientific ARTICLES

Drug Resistant Shigellae

Resistance to Ampicillin and Other Antibiotics

M. B. TORRENCE, M.D., M. T. OWENS, B. A. DUDDING, M.D. and

C. T. CHO, M.D., Ph.D., Kansas City, Kansas

THE PREVALENCE of shigella as an etiologic factor in infectious diarrhea especially in the pediatric population can not be underestimated. From 1964 to 1968, the Center for Disease Control reported 45,263 isolates with over two-thirds of these occurring in children under ten years of age.¹ The disorder as seen in the United States usually runs a benign course of one to four weeks, but it can result in serious fluid and electrolyte problems in infants. The most serious form of dysentery is caused by *S. dysenteriae*, which is most often found in the Far East and Central America. Only *S. sonnei* and *S. flexneri* are commonly found in the United States.

The emergence of antibiotic resistance to shigella is not a new problem. The first drug found to be efficacious in shigella infections was the sulfonamides, but in the late 1940s the emergence of resistant strains made these agents useless in therapy.² Thereafter, the tetracyclines enjoyed some use along with streptomycin. However, resistance to these two agents developed rapidly and they were replaced by ampicillin in the early 1960s. A report from Japan in 1963, indicated a rising ampicillin resistance in shigella.³ Despite these reports, it was not until the late 1960s that the level of ampicillin resistant shigella became apparent in the United States.

Materials and Methods

The bacteriological data on shigella isolated from

January 1968 through July 1973, at the University of Kansas Medical Center were reviewed. The antibiotic sensitivity reports were available, except in 1970. Antibiotic sensitivities were performed by the standard Kirby-

An observation of the appearance of ampicillin and multiple resistant shigella is presented.

Bauer disc technique. The following antibiotic disc potency was used: ampicillin 10 mcg, cephalothin 30 mcg, chloramphenicol 30 mcg, gentamicin 10 mcg, kanamycin 30 mcg, penicillin G 10 mcg, polymyxin B 300 mcg, streptomycin 10 mcg, and tetracycline 30 mcg. The degree of sensitivity was determined by measurement of the inhibitory zone diameter. A size of less than the following measurements was considered resistant to the respective antibiotic: ampicillin 11mm, cephalothin 14 mm, chloramphenicol 12mm, gentamicin 12mm, kanamycin 13mm, penicillin G 11mm, polymyxin B 8 mm, streptomycin 11mm, and tetracycline 14mm.

Results

A total of 211 isolates were retrieved, 169 (80.1%) of which were *S. sonnei* and 42 (19.9%) were *S. flexneri* (*Table I*). Other species of shigella were not isolated during this period of five and one-half years. The number of isolates varied slightly, ranging from 23 to 54 annually. The number of *S. flexneri* was con-

From the Departments of Pediatrics and of Pathology, University of Kansas Medical Center, Kansas City, Kansas 66103.

Address reprint requests to: C. T. Cho, M.D., Department of Pediatrics, KUMC, Kansas City, Kansas 66103.

TABLE I
ISOLATES OF SHIGELLA SPECIES, 1968-1973*

<i>Shigella</i> sp.	1968	1969	1970	1971	1972	1973*	Total %
S. sonnei ...	44	25	16	21	39	24	80.1
S. flexneri ...	10	3	7	11	8	3	19.9
Total	54	28	23	32	47	27	211 (100)

* Until July 1973.

sistently less than *S. sonnei* in our population. The trend in drug resistance was seen in both *S. sonnei* (*Table II*) and *S. flexneri* (*Table III*). Among the various antibiotics tested, ampicillin showed the most significant change during the past three or four years. Resistance to ampicillin from 1968 to 1973, increased from 0 to 87.5 per cent in *S. sonnei* and from 0 to 66.6 per cent in *S. flexneri*. The resistance of *S. sonnei* to tetracycline, streptomycin, and penicillin in the first half of 1973 was 85.7 per cent, 100 per cent, and 54.1 per cent respectively. Although the number is small, resistance of *S. flexneri* to the above three drugs showed a similar trend of increase. A parallel increasing resistance to *S. sonnei* and *S. flexneri* was observed in ampicillin, tetracycline, and streptomycin. Furthermore, our data show that no strains of *S. sonnei* or *S. flexneri* were resistant to all three antibiotics (ampicillin, tetracycline, streptomycin) in 1968, whereas 68 per cent of shigella were resistant to all three antibiotics in 1973.

Our in vitro data further indicated that most strains of shigella isolated from our hospital have remained sensitive to cephalothin, chloramphenicol, kanamycin, gentamicin, and polymyxin B.

Discussion

During the past several years, a changing relative importance of *S. sonnei* versus *S. flexneri* have been observed in the United States.¹ Our data and reports from Houston⁴ and New York⁵ have noted that *S. sonnei* was much more common than *S. flexneri*, the former has been in the range of 80 per cent to 89 per cent. The reason and significance of this changing prevalence of *S. sonnei* is not apparent. It has been known that *S. sonnei* withstands environmental insults such as a cooling and drying much better than either *S. flexneri* or *S. dysenteriae*.⁶ It is not clear whether *S. sonnei* is being selected because of these environmental factors. A similar trend of changing prevalence of *S. sonnei* versus *S. flexneri* has also been observed in Europe and the Far East in recent years.¹

As late as in 1973, ampicillin has been recommended as the drug of choice for shigellosis.⁷ The efficacy of ampicillin in shigella has been documented in studies which demonstrated arrest of the inflammatory process and a decrease in the duration of excretion.⁸ These studies pertain to severe and moderate infections where dehydration and electrolyte problems frequently arise. However, recent reports from Washington, D. C.,⁹ Connecticut,¹⁰ and New York⁵ indicated that shigella resistance to ampicillin ranged from 82 per cent to 95 per cent, and multiple resistance to three drugs or more occurred as high as 47 per cent. Our data indicate that the emergence of ampicillin and multiple resistant shigella has now spread to the Midwestern and perhaps other areas of the United States.

The increasing incidence of ampicillin and multiple resistant shigella has been attributed to resistance transfer among the Enterobacteriaceae.⁹ In 1959, Watanabe

TABLE 2
DRUG RESISTANCE OF SHIGELLA SONNEI FROM 1968-1973*

Year	1968	1969	1971	1972	1973
No. of strains	44	25	21	39	24
Ampicillin	0	1(4.0%)	8(38.1%)	25(64.1%)	21(87.5%)
Cephalothin	1(2.3%)	0	0	0	2(8.3%)
Tetracycline	3(7.0%)	4(16.0%)	10(47.6%)	25(64.1%)	12(85.7%)†
Chloramphenicol	0	2(8.0%)	—	—	1(4.1%)
Streptomycin	6(100%)‡	—	7(33.3%)	28(71.8%)	14(100%)†
Kanamycin	1(2.3%)	4(16.0%)	0	1(2.5%)	1(4.1%)
Polymyxin B	0	1(4.0%)	0	0	0
Gentamicin	—	—	0	0	0
Penicillin	—	—	—	16(41.0%)	13(54.1%)

* No sensitivity data available for 1970.

† Only 14 isolates tested.

‡ Only 6 isolates tested.

TABLE 3
DRUG RESISTANCE OF SHIGELLA FLEXNERI FROM 1968-1973*

Year	1968	1969	1971	1972	1973
No. of strains	10	3	11	8	3
Ampicillin	0	0	3(27.3%)	4(50%)	2(66.6%)
Cephalothin	1(10%)	0	0	0	0
Tetracycline	1(10%)	0	4(36.4%)	5(62.5%)	2(66.6%)
Chloramphenicol	0	0	0	—	—
Streptomycin	2(20%)	0	3(27.3%)	6(75%)	2(66.6%)
Kanamycin	1(10%)	0	0	0	0
Polymyxin B	0	0	0	0	0
Gentamicin	—	0	0	0	0
Penicillin	2(20%)	0	—	—	—

* No sensitivity data available for 1970.

in Japan showed the multiple resistance to antibiotics was "infectious" because of the presence of resistant factors (R factors) which were transferred among *E. coli*.³ In 1966, Kabins and Cohen¹⁰ and Datta¹¹ showed that R factors were present in shigella and that multiple drug resistance could be transferred to other enteric bacteria by conjugation.

The process of conjugation involves the actual coupling of bacteria with subsequent transfer of genetic information (DNA). This genetic information in bacteria may be incorporated in chromosomes or exist as autonomous particles in cytoplasm. These cytoplasmic particles, episomes or R factors, contain a hypothetical part, resistance transfer factor (RTF), which mediates transfer of genetic information. The RTF contains variable numbers of drug-resistance markers that are transferable as a complete unit; namely, if an organism is resistant to two drugs, such resistance may be passed on to the recipient bacterium. The level of resistance conferred by these extrachromosomal pieces of DNA has been shown to vary from drug to drug and from host to host, but only actual contact between male and female bacterium is required for this transfer. At the present time, it is not known how the R factor causes the resistance, but it is postulated that this genetic information causes permeability changes or enzyme production which inactivate the antibiotic.¹² Pollock,¹³ in 1962, demonstrated that R+ cultures of shigella produce a penicillinase which nullifies the effect of penicillin. It should be emphasized that the drug resistance itself is not transferred—only the genetic information, allowing the organism to develop resistance, is exchanged. Furthermore, it is conceivable that a resistant strain could lose this resistant property through a series of exchanges by actual loss of episomes or R factors.^{11, 14}

From the epidemiological point of view, transmission of shigella is by fecal/oral route, thus poor hygiene and poor sanitation contribute greatly to the prevalence of shigellosis. The organisms enter the gastrointestinal tract and invade the lamina propria causing edema, thrombosis and ulceration of the mucosa, which exudes the pus and blood characteristically found in the stools in severe cases of disease. Most cases of shigellosis are mild; after infection, the organisms propagate and usually last for only one to two weeks, with bacterial clearance from the gastrointestinal tract within a week in 30 to 60 per cent of the cases. Although it is uncommon, the carrier state has been reported to exist for over a year.¹⁵

In view of the self-limited nature of the disease and the problems of drug resistance, mild infections should probably not be treated with antibiotics.² However, severe cases, the food handlers with prolonged excretion of the organism, and others involved with public contact should be treated with antibiotics.¹⁶ If treatment is indicated, indiscriminate use of antibiotics should be avoided. Our findings in conjunction with others indicate that ampicillin is no longer the drug of choice. Our in vitro data suggest cephalothin is effective against shigella, however, its efficacy in shigella infection in man has not been tested. From the available data, it appears that kanamycin or gentamicin may be used in severe infection. Proper sensitivity studies should be accomplished. It should be noted that in vitro sensitivities may not totally correlate with in vivo action.² Recent limited studies have indicated that co-trimoxazole (trimethoprim-sulfamethoxazole) is of therapeutic value in the treatment of shigellosis.^{17, 18} Patients treated with co-trimoxazole recovered more quickly, and the drug eliminated shigellae from their feces more rapidly. If

co-trimoxazole should be licensed in this country for use in shigellosis, co-trimoxazole may be a valuable therapeutic alternative to other more toxic drugs. It is essential to point out that the most important action in controlling shigella infections is public health measures designed to promote sanitation, hygiene, and public education.

Because of the repeated emergence of resistant shigella, new modes of therapy need consideration. Recently, the use of oxalinic acid (a quinolone derivative related to naladixic acid) used in urinary tract infections is believed to be efficacious in experimental studies.² The properties of resistance to oxalinic acid are not transmitted by episomes, thus transferable resistance is avoided. However, the problem of alteration of normal bowel flora by suppressing *E. coli* needs further evaluation. Recent clinical studies with this preparation have been encouraging.¹⁹ Another approach is to alter the environment by compounds which alter the acidity in the bowel, such as lactulose.²

That the phenomenon of infectious drug resistance among the shigella occurs seems to have been adequately demonstrated, however, the far-reaching implications of this problem will only become evident in the future. At the present, ampicillin is no longer the drug of choice for shigellosis. Certainly with the increasing use of antibiotics for all bacterial infections, resistance transfer among other enteric species such as *Salmonella*, *Proteus* and *Klebsiella* is a reality and will continue to complicate and frustrate antibiotic treatment.

Summary

The rise of ampicillin and multiple drug resistant shigella has been observed at the University of Kansas Medical Center from 1968 to 1973. Among 211 isolates of shigella, 80 per cent were *S. sonnei* and 20 per cent were *S. flexneri*. Our data revealed that ampicillin resistance had risen from 0 to 87 per cent in *S. sonnei* and from 0 to 66 per cent in *S. flexneri*. In addition, the multiple drug resistant strains also showed a parallel increase. Although ampicillin has long been recommended for shigellosis, our findings in conjunction with others suggest that ampicillin is no longer the drug

of choice. Because of the repeated emergence of resistant shigella, new modes of therapy need consideration.

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KUMC Burn Center

First Six Months

DAVID W. ROBINSON, M.D.,* *Kansas City, Kansas*

DURING THE PERIOD between July 2, 1973, and January 2, 1974, there were 52 admissions to the Burn Center, five still being in the hospital. This is a burn center where the very severe burns come, and there is a high mortality. There were 16 deaths; two occurred on the day of admission. Nine patients died with burns of over 50 per cent of the body surface. Only one under the age of 65 died with a lesser than a 50 per cent burn (this was a 20 per cent electrical burn, received late, with very deep muscle damage, and with renal failure and pulmonary edema). Analyzing the causes of death from burns, there were five overwhelming burns, in the catastrophic class of 75 per cent or more. Pneumonia accounted largely for two deaths, cardiac failure for two, respiratory burns for two, and sepsis for two. Sicklemia, renal failure, and massive gastrointestinal bleeding accounted for the other three. Two patients were under the age of two, and three were over the age of 65.

The causes of the burns were as follows: gasoline or oil fires, 21; gas explosions, 8; warehouse or house fires, 6; scalds, 6; electrical burns, 6; hot grease, 2; chemical burns, 2 (1 phosphorus, 1 hydrochloric acid), and a car accident with a hot exhaust pipe caused one burn.

Twelve of the patients were considered septic on the basis of a very high temperature with spiking fever. Positive blood culture was present in only one of these patients. Six had severe cellulitis, staph grown from each one. Three had pneumonia, with mixed cultures. Two had staphylococcal infection. Respiratory burn was present in two, and cystitis in one. Of these septic patients, three were due to scalding, and one was from a gas explosion, with only second-degree burns. Of the many cultures taken, the predominant organisms were *Staphylococcus aureus* (28), *Pseudomonas aeruginosa* (23), *Klebsiella enterobacter* (21), *Candida albicans* (9), *Enterobacteriaceal* (11), with a mixed number of saprophytic organisms found, but a low incidence of streptococcal cultures (3), and *E. coli* (5). Sulfamylon cream was used topically on 33 of these patients; Bac-

tracin ointment applied to 12; silver sulfadiazine to 4; methicillin drip for staph infection in 2, and Dakin's wet dressings in 1. Furacin dressings were applied in 2, and some of the other agents used for one reason or another were: calcium gluconate, copper sulphate, gentamycin injection. Grafts were done on 24 patients. Homografts were applied in 4 patients, and pigskin grafts in 4.

With regard to hospital stay, the average stay in the 16 who died was eight days. The average stay for those

The Gene and Barbara Burnett Burn Center at the University of Kansas Medical Center was opened July 2, 1973. The experience of the first six months is reviewed and the general plans of burn management are discussed.

who lived was 20 days. Excluding the few who were listed as having burns of 15 per cent and under, the average stay in the hospital was 24 days.

Complications listed in the burn patients were many. Pulmonary edema was listed in five patients. Three of these had definite respiratory burn components. Aural chondritis was present in four, pneumonia in four, renal failure to some degree in four, hypernatremia in four, mental confusion in four. Two each are listed as cardiac failure, loss of graft from infection, post alcoholic sequelae, nerve palsies, and gastrointestinal bleeding. The complications listed as one each were pneumothorax, sicklemia, and cystitis.

Admissions have been spasmodic, at times not many for a week or ten days, and then two, three, or four at once.

General Plans of Therapy

Patients are received primarily by referral from physicians or directly through the emergency room. If too long a delay (over 2-3 hours) would be occasioned by transporting from a distance without reasonable assurance of fluid replacement, the patient should be resuscitated at the nearest medical facility, usually a hospital, before being sent on. A lengthy ambulance ride without adequate treatment would be conducive to shock, possibly irreversible; however, with adequate homeo-

* Professor of Surgery; Director, Gene and Barbara Burnett Burn Center, University of Kansas Medical Center, Kansas City, Kansas 66103.

Address reprint requests to: David W. Robinson, M.D., KUMC, Kansas City, Kansas 66103.

static stabilization, the patient can be transported more safely.

Primary Resuscitation—fluid and electrolyte requirements and problems related to major organ support. Rapid access to a good size vein, often the saphenous, by a cutdown method with a large size tube (#15, if possible) insures access to the intravascular space. Normal saline or 5% dextran in water may be started at once and given rapidly, but not in excess of 1000 ml. Ringer's lactate or other balanced salt solution is better for replacement and may be given very rapidly (depending upon the age and medical condition) until urine is excreted in good quantity. If the urine is dark, indicating hemolysis and acid hematin formation, fluids should be increased until the urine clears. If there is concern about renal function because of the length of time before adequate fluid replacement and because of hypotension and dark urine, the rapid infusion of 1 to 2 liters of saline or Ringer's lactate, followed by a urinary osmotic diuretic (such as 500 ml of 5% mannitol or 40 mg of lasix) should be given to start the urine flow. Fluids in quantities of 1 to 2 more liters or more of Ringer's lactate should follow, monitoring the urinary output hourly, and trying to maintain an output of between 50 and 100 ml per hour. Such monitoring requires a catheter being placed in the bladder, a procedure accomplished soon after the intravenous administration of fluids is established. A central venous catheter is introduced into the region of the right side of the heart via whatever vein is available, hopefully one through unburned skin. Central venous pressure readings help monitor cardiac adequacy. If the readings rise above 10 cm of water, the venous return may be too great for the heart's competence, and fluids will have to be given at a slower rate, but usually with the patient in such incipient shock, fluids can be given at a rapid rate and in large quantities.

Although the various replacement formulas¹⁻⁵ will give a rough indication of the fluid needs for resuscitation, much more credence is given to the administration of fluids according to the patient's clinical response, especially his urinary output, with some, but considerably less, attention to central venous pressure reading and hematocrit determinations. Monitoring the circulating blood volume and cardiac output will be employed more in the future, to follow the patient's status.

Requirements after the first day are somewhat less, but again are given according to the urinary output. Colloid replacement,⁶ scarcely given in the first 24 hours, becomes more important. Blood plasma, plasminate, albumen, or whole blood are not indicated on the first day unless there is evidence of such loss from concomitant injuries. Renal function is best established with

water and electrolytes at first, but maintenance of osmotic equilibrium is best obtained by colloid the following day.

Fluids by mouth are deleterious for a severely burned patient. Gastric dilatation with vomiting produces further fluid and electrolyte losses, and compounds the problem. A nasogastric tube is often necessary to deflate the stomach in the first few days, and losses from suction must be replaced.

The large, open burn wound loses water and heat by evaporation,⁷ so that extra replacement for such insensible losses, which often may be from 1.5 to 3 or more liters per day, requires more maintenance fluid.

Laboratory surveillance daily or as often as necessary is required to correct electrolyte imbalance, renal clearance, and pulmonary exchange problems. In the first two days, high blood potassium levels, caused by tissue destruction and renal inadequacy, must be checked and after two to four days, especially if large quantities of sodium in saline or Ringer's lactate have been given, high blood sodium levels indicate a change to water as 5% dextrose in water. The BUN or creatinine and its clearance are indicators of renal function. Blood gas determinations PAO₂ and PACO₂, from blood usually taken from the femoral artery, help determine pulmonary function. Mechanical assistance by forced breathing of oxygen through an endotracheal tube if severe, or simply by moist oxygen in a tent or mask, may help. Too long a time on the respirator (over 2-3 days) or too high a concentration of O₂ (over 50%) produces problems relating to these modalities and will actually decrease pulmonary compliance. Such procedures may be necessary, but the patient should be weaned off of them as soon as his condition and blood gases indicate. Actually, the giving of large quantities of sodium intravenously contributes to fluid storage in the lungs, and a secondary pneumonitis may follow with its exudative phenomenon, often fatal. In the first few days, smoke inhalation with actual thermal damage to bronchi or alveoli may be the cause of pulmonary inadequacy. Tracheotomy is a late resort necessary for the rare patient to permit adequate ventilation.

Cardiac support is indicated for large burns, especially in the elderly patient. Although empirically given, there is supportive evidence of a cardiac depressor at work, so that digitalization is started early and maintained for about one to two weeks, monitored by the electrocardiogram.

Primary Treatment of the Burn Wound. Since infection is still the most common cause of death, every effort should be made to prevent further contamination from exogenous sources. All attendants should wear masks, caps and protective clothing, so as not to introduce more

organisms than are already present on the burn surface and indigenous in the patient.

Thorough but rapid, gentle, cleansing debridement is done with lukewarm water and very dilute soap to remove the gross dirty surface, which is then flushed off with sterile normal saline solution and the wound left exposed, except for the application of a local chemotherapeutic drug to suppress bacterial growth, especially of the gram-negative variety. This center has employed Sulfamylon ointment or silver sulfadiazine, but .5% of aqueous silver nitrate or gentamycin ointment are highly acceptable forms of local treatment. Bacitracin ointment has been helpful on the backs of hands and over the face to make a soft, pliable skin surface which allows maximum mobility for maintenance of range of motion. Topical agents should be applied at least twice daily.

Daily mechanical cleansing in the tub, Hubbard tank, or by flushing with warm water helps cleanse the eschar, get rid of infected exudates and detritus, and provides more drainage. Such tanking is usually not done until the fluid balance is established, after the first three days, but is done regularly after that. The patient is lowered into and raised from the tank by a canvas litter frame and weighed daily by a weighing device built into the hoist mechanism. All tank procedures are done in the unit.

Antibiotics. Systemic penicillin is given early, in large intravenous dosage, for the first five days to prevent early streptococcal infection. If sensitive to penicillin, Erythromycin may be used. Tetanus prophylaxis is given usually as a booster dose of tetanus toxoid. Subsequent specific antibiotic therapy is given according to cultures and sensitivity tests.

Allergic manifestations of local chemotherapy have been relatively rare, about 5 per cent. Furacin ointment causes a rash in some patients, but such a risk should not preclude its use.

Metabolism and Nutrition. Daily weighing is important to monitor gains or losses⁸ which may indicate the storing of fluids or the loss of tissues from the inherent catabolism of the burn and the considerable caloric losses from fluid evaporation. Negative metabolic balance with weight loss of about 250 gm daily is the rule, and requires a high intake of calories with emphasis on proteins and carbohydrates. Because voluntary oral intake is often insufficient to meet these demands, which are two and three times the normal caloric value for patient size and age, forced feeding through a small nasogastric tube at frequent intervals or even intravenous hyperalimentation through a central venous catheter may be necessary. The dietician's help is sought and the calculated caloric intake is charted daily for such patients. Increased specific nutritional needs, such as high

intakes of Vitamins C, A, and B and iron, are given. Intravenous feeding catheters should be changed about every four days, and the catheter tips cultured on each change, because of the real danger of sepsis from such a method.

Later Wound Care. When full thickness losses are evident, usually between two and three weeks post burn, local efforts should be directed toward cleaning up the wound, removing the eschar, and promoting wound coverage. Sepsis here may complicate the picture, necessitating bolstering of the patient's general condition by increasing the caloric and protein intake and the giving of blood for falling hemoglobin and proteins. Debridement in the tank or actual excision of the eschar under anesthesia is indicated. Split skin grafts are often taken at the time of debridement and stored at just-above-freezing temperatures in saline, to be reapplied when hemostasis is assured, in about two days. The immediate application of grafts may cause the loss of skin, because of bleeding under the grafts or because debridement has not been thorough and deep enough, thereby leaving dead tissue. A dirty granulating surface or an infected open wound can be cleansed by covering with cadaver homografts or xenografts, usually pigskin commercially purchased.

Skin Grafts. Such biologic wound dressings, homografts or xenografts, are removed every 2-3 days, before becoming too adherent, and the patient's own split grafts applied.⁹ To insure drainage and to prevent loss from hematoma or infection, meshing of the auto-grafts (patient's own skin) is useful to insure takes and the surface coverage of the graft, by stretching it to cover a wider area. The grafts are either secured with a few sutures or steristrips, or are simply laid on. Occlusive pressure dressings are sometimes useful to protect the graft, helping them to conform to irregular surfaces and preventing mechanical trauma or undue motion. Harvesting skin from the few available donor sites must be carefully planned and thin grafts are taken, so that another crop of skin can be cut in the shortest possible time, even as early as 12 days. Donor sites are covered with fine-mesh rayon and left open to dry out. After reepithelialization, the rayon falls off or is gently teased off. Infected donor sites are a real hazard, because the thin remaining dermis with its viable islands of epithelium may be destroyed, converting the good regenerating skin into possible full-thickness loss. All operative procedures are done in the unit's operating room.

Split skin grafts are cut with a dermatome (mechanical, electrical or gas operated), and average about 3 mm in thickness. Grafts to the lower extremities should be well adherent, and at least seven to ten days old before

the patient can get up to walk. Such dependently placed grafts must be protected by elastic support (ACE bandaging) whenever the patient stands or lowers the legs in the first three to six months. Unsupported grafts can be lost because of blood or serum beneath them, or may become darkly pigmented. Daily massage with baby oil or cold cream helps keep the grafts soft and pliable.

Scars and Contractures, Splints and Motion. The scar contracture phase begins early, but reaches its height about two months after wound coverage. Much can be done to prevent these defunctionalizing and disfiguring complications, but the corrective measures should start early. The earlier the skin coverage, the less the scar hypertrophy; and the thicker the graft that will take, the less the contracture. During the early phase, when trying to decide if grafting will be necessary, hands, wrists, and fingers should be put through as complete a range of active and passive motion as possible. Soaks under water will help, but it is more important to be sure that the hands are maintained in the correct position of function. With the help of physical and occupational therapy, splints are so constructed as to produce a slight cock-up of the wrist, 90° metacarpophalangeal flexion, interphalangeal extension, and thumb in midway position of opposition. The splints are worn at night and often part of the day between multiple periods of active motion. Extension splints for elbows and knees with elevation maintain best function. Pillows are removed from patients with neck burns to put the head in extension, and tight-fitting, molded neck splints are constructed to be worn as soon as epithelization is nearly complete. Molded face masks or special elastic stocking pressure for the face help prevent hypertrophic scarring.¹⁰ Such pressure devices should be used for from three to six months. The injection of triamcinolone into contractures early (the dose not to exceed 120 mg over a two-months period) may soften such scar bands and allow active motion through greater range. Such daily movements, active and passive, are under the guidance of physical therapy.

The Psyche and Rehabilitation. Daily encouragements, including cajoling and even badgering, are necessary to keep patients active and stimulated. Seeing patients who have been through the same ordeal getting better is a positive force for rehabilitation. Visitors are allowed for short visits only. Frequent contacts and conversation with medical staff, nurses, and aides gives a positive boost. Each patient has a color television set, which provides a distraction and positive contact with the outside world. Windows in the room allow orientation to the world. Patients are returned to their homes and to their family doctors as soon as possible, and are followed in the outpatient department thereafter. Reassur-

ances about their family, friends and job are important, and the return to work as soon as can be safely done greatly helps morale.

Special Problems

Renal. Renal failure with high or low output is a serious complication and often requires consultation with the renal team to help supervise problems of fluid and electrolyte imbalance, as well as those of azotemia. In the early resuscitation stage, renal failure is due to under-hydration, ischemia, hypotension, and circulating free hemoglobin or myoglobin. Although extra fluids need to be given to maintain homeostatic balance, too much fluid or sodium stores water in the tissues and may produce severe physiologic dysfunction. A careful, delicate balance of how much and what kind to be given must be made. Severe potassium imbalance and azotemia can be corrected by potassium withdrawal through the use of Kayexalate (cation-exchange resin) enemas, peritoneal dialysis, or hemodialysis. Anuria or severe oliguria from renal failure may be present for from two to three weeks, until renal function is restored.

Stress Ulcer (Curling's). Gastrointestinal bleeding is of dire consequence.¹¹ Multiple petechial ulcers of the upper tract, stomach, duodenum, and jejunum are common within the first few days or whenever sepsis supervenes. Nasogastric suction not only prevents distention but also allows observation of the aspirated fluids for the presence of blood. Tarry stools, weakness, and anemia may be the presenting symptoms and signs. The frequent administration of antacid preparations does little good. If severe bleeding persists, exploration with gastric resection or vagotomy plus pyloroplasty may be indicated, even if it requires cutting through the burned abdominal wall. Salvage will not be great.

Distention and Obstruction. Hypokalemia and hypoproteinemia may cause distention and diminished peristalsis, requiring potassium and protein replacement. Stress itself causes contracture of sphincters and dilatation of the bowel with gaseous or interluminal fluid distention. An unusual obstruction is that seen in thin, wasted burned patients, often children, who have obstruction from the ptotic bowel dragging against the superior mesenteric vessels. Turning the patient on to his side or into the prone position may relieve the obstruction.

Sepsis. Septicemia is a dire threat and still the most common cause of death, despite local and systemic chemotherapeutic and antibiotic agents. Frequent tubbing, flushing, and wet dressings remove infected exudates, and massive antibiotic therapy for the specific organism is necessary. Maintenance of body's defenses by high caloric intake and transfusions of whole blood is

important but may be too slow for the immediate intense therapy needed. Gentamycin, Polymixin B, carbenicillin, and other drugs are effective against gram-negative invaders but must be given in prescribed doses for the correct time period. Frequent blood cultures are indicated. Sepsis may be preceded by a chill and severe temperature rise (especially with gram-positive organisms), or it can be heralded by weakness, collapse, hypotension, abdominal distention, and a pink flushing of the skin. It must be remembered that the strong antibiotics used may be nephrotoxic and ototoxic. Three days is long enough to give gentamycin or Polymixin B at one time. Yeast infections are not uncommon complications after giving some antibiotics, and are hard to detect and treat. Against *Candida* sepsis, amphotericin B is currently the only effective agent, but it is a dangerous toxic agent.

Lower Urinary Tract Infection. Cystitis is relatively common due to prolonged use of indwelling catheters. Two to three daily flushings with a bladder antiseptic will help, but the most important factor is the removal of the catheter as soon as possible. Periurethral abscess in the male occurs fairly frequently and may require incision and drainage, certainly catheter removal, and the use of a specific antibiotic for the organism cultured.

Anesthetic Complications. Cardiac arrest occurs in burned patients usually soon after anesthesia is induced or when the patient is moved, as from cart to table or turned on the table. This is due to hypotension and inadequate venous return with an already low blood volume and perhaps low blood potassium. Rapid infusion at the time of induction will help prevent this frequently fatal complication.

Endotracheal intubation of the patient with a neck contracture is hazardous. Special care during induction is needed to prevent airway obstruction. Occasionally, the contracture must be incised rapidly to allow the head to extend. Emergency tracheotomy may be required during induction for some patients.

Ketamine for dressings or operative procedures is quite satisfactory for children, but adults may react badly, having remembrance of bad dreams. The use of Valium preceding the ketamine seems to reduce the memory of dreams.

Personnel Problems. Because the Burn Center is confining, depressing and removed from the mainstream of the hospital, personnel working the regular shifts daily may have reactive psychological problems. Those fully dedicated and trained have an understanding of these problems. But some quite mature and well-trained professionals have a difficult time adjusting to the severely ill, who do not seem to change much from day to day, and who are so desperately ill. A series of fatalities in

overwhelming disasters depresses the younger attendants, who feel that surely something more should have been done. A spirit of camaraderie helps, and an explanation by the staff should make clearer the realities of a grim situation. Occasional rotations of nurses and attendants back to other wards for a few weeks may resolve this problem.

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Clinical Cardiology

Varicose Veins

JESS R. YOUNG, M.D.,* *Cleveland, Ohio*

VARICOSE VEINS is one of the most common disorders affecting man. This condition is probably the result of a congenital weakness of the venous walls and the valves. The incidence is higher in women than in men. Obesity, pregnancy, prolonged standing, and thrombosis of the deep veins are important contributing factors.

Clinical Picture

The most common symptoms are those of aching, fullness, or fatigue on standing which is relieved by recumbency or by the wearing of an elastic stocking. It is important in the diagnosis to exclude other conditions such as tension fibrosis, water-retention syndrome, osteoarthritis, or a disk that may be causing symptoms in a patient with varicose veins, for even severe varicosities may be relatively symptomless.

Superficial thrombophlebitis and external hemorrhage are possible complications of varicosities. When severe varicose veins have been present for years, chronic stasis changes may appear with pigmentation, fibrosis, dermatitis, and ulcerations.

Treatment

The aim of medical therapy is chiefly to relieve symptoms and to try to prevent the progression of varicose veins. All patients with varicosities should wear elastic stockings, exercise their legs, keep their weight at an ideal level, and, when possible, should sit with their legs elevated. They should avoid wearing tight clothing such as garters and panty girdles, and should avoid prolonged standing. It may be helpful to elevate the foot of the bed between four and six inches to decrease venous pressure while sleeping.

When varicosities are small and the patient wishes treatment for cosmetic reasons, injections of sclerosing solutions may be attempted. For more advanced varicosities, the patient either should wear elastic stockings or else should undergo surgical removal of the affected veins by ligation and stripping. Any varices not removed by these procedures subsequently may be injected with sclerosing solutions as an office procedure.

* Department of Peripheral Vascular Disease, the Cleveland Clinic Foundation, Cleveland, Ohio.

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Superficial Thrombophlebitis

Thrombophlebitis in one of the superficial veins may be caused by trauma, intravenous injections, or may be associated with certain systemic diseases such as blood dyscrasias. Recurrent superficial phlebitis may be the first manifestation of thromboangiitis obliterans or of an occult malignancy, or may occur for no apparent reason.

Superficial phlebitis usually presents as a red, warm, painful, tender nodular area directly under the skin along the course of a vein. Edema is not present. The clot is adherent and is rarely the source of emboli.

Erythema nodosum may be quite difficult to differentiate from superficial phlebitis, and a biopsy may be necessary. Cellulitis should present no problem in differential diagnosis, for the process is more diffuse and there is no palpable cord along the course of the vein. Lymphangitis likewise should present no problem in diagnosis, for again no thrombosed vein is palpable and lymphangitis is associated with chills and a high fever.

Treatment

Most patients with superficial phlebitis need nothing more than rest and elevation of the extremity and application of warm, moist packs for a few days. When the pain and inflammatory reaction are severe, phenylbutazone or oxyphenbutazone may be given for three or four days. When the phlebitis continues to extend despite treatment, anticoagulation therapy should be initiated.

Deep Thrombophlebitis

Deep thrombophlebitis is still one of the more common complications of major surgical operations, pregnancies, fractures or injuries of the lower extremity, or any serious illness that requires the patient to be confined to bed. The increased incidence with congestive heart failure, polycythemia, ulcerative colitis, and carcinomatosis is well known. In many instances, deep thrombophlebitis occurs for no known reason.

Early venous thrombosis may not be recognized clinically because of the absence of local or constitutional signs. The first indication of its presence may unfortunately be the occurrence of pulmonary embolism. However, this asymptomatic bland type of venous thrombosis

(phlebothrombosis) usually progresses to the more inflammatory state of thrombophlebitis which can be diagnosed clinically.

In the majority of patients, the onset of deep phlebitis is gradual and mild, and the symptoms are often mistaken for rheumatism or muscle cramps. The discomfort is described as a dull ache in the calf or in the region of the thigh which is worse on standing, but relieved by recumbency.

The findings in deep phlebitis include edema, distended superficial veins, localized tenderness in the calf region or over the femoral vein, and the presence of Homans' sign with pain in the calf region on dorsiflexion of the foot with the knee in flexion. Usually, only minimal systemic reaction accompanies deep venous thrombosis. A low-grade fever, slight tachycardia, malaise, or a sense of apprehension may be present.

Various methods have been proposed to detect intravenous thrombi, including the use of radioisotopes, ultrasonic flow detection studies, and measurement of electrical impedance. Although these tests hold great promise, venography remains the most definitive method of study and should be done when the diagnosis is in doubt.

Treatment

Because of the constant threat of pulmonary embolus, anticoagulant therapy with heparin should be started as soon as venous thrombosis has been diagnosed. Heparin is injected intravenously in doses of 5,000 units every four to six hours, or subcutaneously in doses of 10,000 to 15,000 units every 12 hours. If the diagnosis is in doubt, heparin should be given prophylactically, unless contraindicated, until venography is performed and the issue is settled.

Ligation or clipping of the inferior vena cava is performed in the patient in whom heparin is contraindicated, and in the patient in whom pulmonary embolus develops while he is on anticoagulant therapy.

The patient with deep phlebitis should be kept in bed with his extremity elevated and, if arterial pulses are present, treated with warm, moist packs. After from five to seven days, the tenderness usually subsides and the patient may begin to ambulate. Then, the dosage of heparin is tapered and stopped. When significant edema persists, a well-fitted elastic stocking should be worn until such time that edema no longer appears when the stocking is not worn.

Venous thrombectomy may be considered in massive venous thrombosis, particularly in young, otherwise healthy patients.

Preventive measures against thrombophlebitis include early ambulation after operation, routine wearing of light elastic stockings by patients confined to bed, eleva-

tion of the foot of the bed, close attention to fluid balance to prevent dehydration, encouragement of active and passive muscle exercises, and avoidance of tight abdominal dressings.

Chronic Venous Insufficiency

After deep phlebitis, the occluded vein usually becomes recanalized but the valves remain permanently damaged. If the patient does not properly care for his leg and wear a good elastic stocking to control edema, signs of chronic venous insufficiency may develop many months or years after the episode of thrombophlebitis. These changes include chronic edema, pigmentation, induration, and dermatitis. After slight trauma, ulcers develop which may be extremely difficult to heal.

Treatment

If the patient is seen at a time when he has only edema and pigmentation, measures should be advised to prevent the complications of dermatitis and ulcerations. He should sleep with the foot of his bed elevated on four- to six-inch blocks. He must wear a well-fitted elastic stocking when ambulatory. Exercise such as swimming, walking, or bicycling should be encouraged, and prolonged standing or sitting should be avoided. Women should not wear panty girdles or garters.

If a small, clean ulceration is present, a modified Unna paste boot is applied to the leg and changed at from seven- to 14-day intervals, depending on the progress of the patient. During this period, he can carry on normal activities as long as his occupation does not entail prolonged standing. Most ulcers will heal in from four to 12 weeks.

When the ulcer is badly infected with surrounding cellulitis, hospitalization may be necessary. The patient should be put to bed with the foot of the bed elevated, constant soaks applied to the extremity, and systemic antibiotics administered. When the ulcer is clean, the paste boot can be applied.

Very large ulcers will heal more rapidly and have a better chance of staying healed if a skin graft is used. It is important to do a wide excision and remove all the indurated area surrounding the ulcer.

Regardless of the method used in healing the ulcer, the patient must continue to wear elastic stockings and carry out the other prophylactic measures to avoid recurrence of the ulcer.

Summary

Varicose veins, venous thrombosis, and chronic venous insufficiency are common disorders affecting millions of people in this country. Numerous forms of therapy have

(Continued on page 242)

The President's Message

The Medical Practice Act of Kansas is broad enough and at the same time has adequate restrictions within the confines of its definition, licensure, and statutory authority to allow the necessary flexibility within legal limits to make for readjustment of MDs' and nurses' roles to meet changing techniques and skills.

I propose that the Kansas Medical Society is on record supporting all the ongoing nurses' education within the state and the expansion of nurses' training at KUMC.

We energetically supported further expansion of the nurses' roles in training of nurse clinicians at Wichita State University with the state being financially responsible for these training programs—again, it being the fundamental responsibility of the education system to produce the type of nurse we need and to insure the adequacy of their education.

Lastly, I, speaking for the physicians of Kansas, assure you individually and collectively, that the Kansas Medical Society will continue its high interest in the Nurse Practice Act, hopefully removing its ambiguities, spelling out in clear language the restrictions, and just as clearly the scope of practice. Frankly, I believe everyone in the Medical Society desires a superior Nurse Practice Act that leaves no room for false or double interpretation of its meaning.



John G. Blunk

President



Editorial COMMENT

Take, of Each, One Part

In idle moments, such as waiting for the traffic light to change or the hot water to make its way up to the bathroom tap, we are given to pondering the origins of this ancient, sometimes honored, and (to the physician's mind, at least) noble profession of medicine. We are a little uncertain whether it was the act of plying the hunter with the courage-inducing brew before he took on the saber-toothed tiger or patching him up after he got back. In other words, did we first prescribe—or use the knife and ligature? At the risk of offending our surgical colleagues (who offend easily when their superior status is questioned), we opt for the medical concept since it seems probable that man agreed to have something poured down him, pushed up him, or rubbed on him before he consented to be incised. At any rate, along with the incantations, masks and purifying flame, every variety of animal, vegetable and mineral substance was soon utilized, limited only by the imagination of the practitioner and availability of a patient too weak to resist.

There's no denying that the physician and his medicinals have never been far apart, and the number and variety of the latter soon spawned an entrepreneur to provide them, presumably leaving the physician more time to practice tying sutures on the bedpost and to develop his characteristic handwriting. Through the years, the apothecary became established as the accepted purveyor of medications and not infrequently the surrogate physician to the community as well (in about equal balance, perhaps, to the dispensing physician).

But it is with compassion that we note that the modern pharmacist has fallen on hard times. This is one of those statements that begs for qualification. Some of them aren't doing too badly financially, but this is due to their merchandizing efforts, whether in the "professional" pharmacy sheltered in a medical building or the supermarket variety where the pharmaceuticals are tucked away behind the housewares and ladies' lingerie. The pharmacist is, at one and the same time, the beneficiary and the victim of pharmaceutical technology. The unicorn's horn has been ground up, purified, and made

into an enteric-coated tablet. The essential chemical has been extracted from the nightshade and bottled in proper strength to permit convenient dosage with the bent teaspoon in the kitchen drawer. The iron has been micronized, capsulized, and merchandized for guaranteed non-irritating consumption. The bureaucratic eye has scrutinized their purity and effectiveness. And with it all, the working pharmacist has become a clerk who transfers the pharmaceutical product from one bottle to another and labels it—or maybe labels it without even transferring it, his most taxing duty being the deciphering of the physician's writing.

The growth of the pharmaceutical manufacturers has had obvious benefits as they are pleased to remind us: research, quality control, support of medical education, the power to contend (if not always win) in the governmental arenas and, of course, a fantastic variety of agents for the benefit of the patient, physician, pharmacist and, incidentally, stockholder. But with this demonstration of the virtues of free enterprise has come a progressive reduction of the role of the pharmacist. The compounding of prescriptions in the pharmacy is all but dead. Even the dermatologists, who dearly love to throw in a pinch of this and a pinch of that, are being provided with ready-made salves to the point that they no longer need their oversize prescription pads.

Now there's nothing wrong with being a pharmaceutical stock clerk, but there is something wrong with training a person extensively in the mysteries of pharmacy for seven years and then put him to work on a job that requires that he—or she—be able to read, count sometimes as high as 100, and type out a label. This is not to belittle the pharmacist—it is to register regret that so little actual use is made of his training.

The physician, meantime, has been an accessory both before and after the fact of this changing pattern. This growing therapeutic armamentarium has been a mixed blessing. Even if he has been able to keep up with the bewildering array of medical agents available—their uses, limitations, relative efficacy, brand name equivalents, and so on—he generally reduces his usage to a

few items he feels comfortable with. Again, there's nothing wrong with this, but it fails to tap the potential of the available agents. Consequently, self-serving governmental studies purport to demonstrate that most physicians are not using the drugs they should or the proper doses, nor are they aware of the dangers to which they may be subjecting the patient.

The pharmacist deserves a better professional role in the health care scene, but he is faced with a fixed dependence upon the physician. The nature of this dependence dictates that any elevation of his status must be accomplished with the blessing if not the active support of the physician. We think the physician can benefit from closer liaison with the pharmacist. He doesn't hesitate to utilize and consult other ancillary services less vital than the supplying of drugs to his patient. In only one aspect can he alone make the assessment of a drug's efficacy: the actual effect of a given medication on a given patient. But he may profit from the pharmacist's advice before his choice of drug is made and, furthermore, if the pharmacist's expertise was properly utilized, he could gain clinical experience which would enhance the value of his advice.

Among the most vocal critics of the physician in his drug utilization are his colleagues in the teaching institutions. If their criticism is justified, it doesn't speak well for their teaching. We suspect, rather, that is goes back to the practitioner's reliance on certain things he has faith in, and it is easier and safer to stay with them rather than try something he is unfamiliar with even though it might be of greater value. His therapeutic effectiveness could be increased if he could look upon the pharmacist as a consultant in arriving at the most effective, safe—and economical—agent available. This is not to suggest that the physician abdicate any of his function and responsibility in the drug care of his patient, but that a plan be devised by which he can take advantage of assistance which has always been available, but which the system has stifled.

We offer herewith and without charge a suggestion for improving the physician-pharmacist relationship—

in this state at least—though we doubt it will please those most directly involved in its implementation. The Department of Pharmacology at the Medical Center and the School of Pharmacy should be combined into one department in the Medical School, which will be responsible for instructing medical students in this area and also the pharmacy students for their function. Autonomy being what it is, we can expect the School of Pharmacy to reject the idea out of hand, and we doubt if the administration at the Medical Center is interested in adding to its already numerous headaches. Nevertheless, closer association at the academic level should lead the students to an easier association in the practice of their postgraduate functions. A step in this direction has been taken with the adoption of a plan for pharmacists to make teaching rounds with the medical staff and students at the Medical Center. It escapes us as to why the School of Pharmacy, its main purpose being to train pharmacists whose service will be primarily an extension of the physician's therapeutic effort, should be separated academically—and geographically—from the principal area of physician training. This amalgamation in itself would serve only a limited purpose, of course, unless there was a subsequent system of communication established between the two groups to perpetuate the advantages of increased mutual respect and cooperation in providing a greater service to the patient.

Pharmacists, in their efforts to upgrade their profession and prevent any more erosion, are tempted to promote plans to control the utilization of drugs—which means, of course, the physician. Witness the recently aborted attempt on the part of the Board of Pharmacy to bring the physician under its control in this area. Such efforts are shortsighted since the physician cannot be displaced from his position of control and responsibility for the patient's drug therapy even if he wanted to be. The effort on both sides should be toward joining forces to improve the utilization of this therapeutic modality which, next to himself, is still the physician's prime weapon.—D.E.G.

Clinical Cardiology

(Continued from page 239)

been proposed. With newer methods of diagnosis of deep phlebitis and with improved evaluation of various types of treatment, perhaps some of the conflicting opinions regarding therapy can be resolved soon.

Letters to VOX DOX should be addressed to the Vox Dox Editor, Journal of the Kansas Medical Society, 1300 Topeka Avenue, Topeka, Kansas 66612.



Personalities—IN KANSAS MEDICINE

Robert A. Gollier, Ottawa, has announced his retirement after 34 years of practicing medicine in this community.

The Secretary of HEW has appointed **Kermit E. Krantz**, Kansas City, to serve on the National Advisory Child Health and Human Development Council of the National Institute of Health (NIH).

William J. Collier, McPherson, **Harl G. Stump**, Hays and **Lloyd W. Reynolds**, Hays, attended the annual meeting of the Southwestern Surgical Congress in Monterey, Calif.

Attending a Cardiology meeting in Las Vegas, Nevada, was **Robert A. Dobratz**, Beloit.

F. Calvin Bigler, Garden City, was elected President of the Kansas Thoracic Society. Others elected were: **Yong W. Kim**, Concordia, President-Elect; **Daniel L. Schlozman**, Kansas City, Secretary-Treasurer; **Gerald R. Kerby**, Kansas City, Councilor to ATS.

Re-elected to head the National Council on Alcoholism for another term was **William S. Simpson**, Topeka.

Earl B. Gehr, Chanute, presented a talk on arthritis at a recent public meeting in Neosho County.

The newly elected Chairman of Kansas Blue Shield is **Alex C. Mitchell**, Lawrence.

Mark Your Calendar Today!

116th KMS ANNUAL SESSION

May 4-7, 1975

Glenwood Manor

Kansas City



Open Letter to the Doctors of Kansas

Dear Doctor, . . . We want your Wife!

Actually, we need her as an arm to help the Kansas Medical Society. The Woman's Auxiliary needs all of our doctors' wives. We need their interest, ability, help, and dues.

Our members are all special people. This first attracted me to the Auxiliary organization. As I tried to pick out why I enjoyed working with Auxiliary and for the KMS, I decided that it was because of the people, the doctors' wives, whom I learned to know. They are interesting women, of varied backgrounds, talents, and interests. They are fun to work with, dedicated as you are to helping people. They are enthusiastic and active ladies. They like parties and also have useful and humanistic goals. They're discouraged by the same things that discourage you, Doctor—government's intrusion into medicine, the profession being used as a political football, and forces trying to break down the patient-doctor relationship. They're willing to write a letter or send a telegram for our legislative program LEGS, and have written many times. They're willing to save drugs, hunt up old x-ray machines and other medical equipment and journals, and pack them off to other parts of the world for International Health. They're willing to work for money for AMA-ERF loans

(over \$1 million last year), to help young people become our future doctors.

Right now, we've been asked to help with the new program IAM (Immunization Action Month), October 1974. We're told we're needed to help educate the people of Kansas to have their children inoculated against smallpox, polio, and whooping cough, to prevent new epidemics. National surveys show approximately 5 million of nearly 14 million children ages 1-4 are unprotected. I'm sure you have seen these statistics. This program is one of community service and education in which all doctors' wives can take the lead in alerting our communities to a danger arising from overconfidence and lack of understanding.

This is just a small part of the Auxiliary to your Kansas Medical Society—that group of different kinds of interesting, interested, intelligent, and willing ladies who need all the wives of the doctors of Kansas to join them. Encourage your wife to join us, Doctor. Tell her to try us—she'll like us!

Sincerely,
Dot Meyer
President,
Woman's Auxiliary to the
Kansas Medical Society

KaMPAC

New Mailing Address Effective Now:

1300 Topeka Blvd., Topeka, Kansas 66612



Book REVIEWS

BLOOD DISEASES OF INFANCY AND CHILDHOOD, 3rd Edition, by Carl H. Smith, M.D. The C. V. Mosby Company, St. Louis. 1972. 874 pages, 175 illustrations. \$29.75.

In its third and final edition—due to the death of the author—this book continues to hold its place as the leading reference on hematologic problems in children. The text has been expanded to incorporate newer knowledge concerning the biochemical, physiologic, immunologic, and genetic aspects of the hematopoietic system. About 1,200 new references have been added and several chapters revised and reorganized. Discussed are the effectiveness of Rh-immune globulin and amniocentesis relative to the prevention of erythroblastosis and the detection of genetic defects; the role of 2,3 DPG in relationship to hemoglobin's affinity for oxygen; phototherapy and phenobarbital for neonatal jaundice; the need for iron in the first year of life, and the immunologic implications of blood disorders. The updated aspects of the hemolytic anemias are presented from the standpoint of the red blood cell membrane, the hemoglobin molecule, and the intracellular enzymatic defects and products of metabolism. Information about the leukocyte includes the biochemical and immunologic problems observed in chronic granulomatous disease, the relationship of E-B virus to infectious mononucleosis and Burkitt's lymphoma. The newer approaches to the treatment, control, and potential cure of leukemia and the lymphoproliferative disorders are discussed in detail. Aspects of the basic scheme of coagulation have been updated. Treatment of hemophilia with the new products such as cryoprecipitate and the amino acid precipitates of purified factor VII is presented. The pathogenesis of disseminated intravascular coagulation is included. The book concludes with a discussion of the purpuras and the recent advances in platelet physiology in relationship to the clotting mechanism and to thrombocytopathy and thrombasthenia. The number

of illustrations was increased from 85 in the 2nd edition to 175 in the current edition, including the striking twin-to-twin transfusion syndrome in color.

The text is recommended as a significant addition to the nucleus of the medical library of the family practitioner, the pediatrician, and the pathologist.—H.C.K.

THE CARDIAC ARRHYTHMIAS, 2nd Edition, by Brenden Phibbs, M.D. The C. V. Mosby Company, St. Louis. 1973. 205 pages, 264 illustrations. \$7.50.

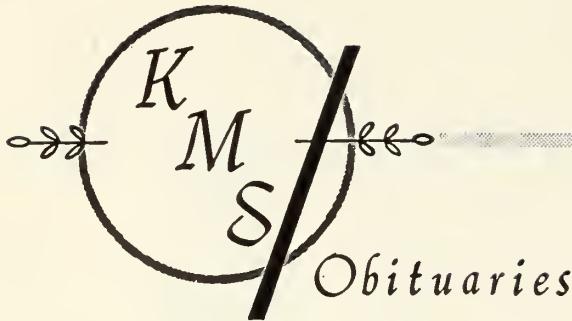
This paperback second edition has an expressed objective to communicate with the utmost clarity to the non-cardiologist. The interested reader is referred to other excellent references for "the more recondite aspects of the cardiac arrhythmias." The language is extraordinarily lucid and the illustrations exemplary. The index is adequate and the volume of 205 pages is modestly priced at \$7.50.

The basic symptoms associated with cardiac arrhythmias, as well as elements of treatment, are interspersed in the description. The book is recommended for all professionals working in the acute sections of the hospital, as well as medical students and resident physicians. The manner of expression by the author is somewhat reminiscent of the expression by the well-known pathologist-author Boyd.—N.V.T.

THE PEDIATRIC NURSE PRACTITIONER, by Fernando J. deCastro and Ursula T. Rolfe. The C. V. Mosby Company, St. Louis. 1972. 154 pages. \$6.50.

This is an excellent source of material for the nurse practitioner.

The common everyday conditions are discussed, with the highlights brought, the important signs and symptoms to look for, and the most important and first treatment that should be given. It is not necessary to weed through details unimportant to the care of the patient.—R.D.B.



KELLOGG F. BASCOM, M.D.

Dr. Kellogg F. Bascom, 82, of Manhattan, died May 3, 1974. He was born September 22, 1891, in Fargo, North Dakota.

Dr. Bascom was graduated from the University of Minnesota School of Medicine in 1929. He practiced medicine in Manhattan since 1935.

Surviving Dr. Bascom are his wife and four sons.

LYNN E. BEAL, M.D.

Dr. Lynn E. Beal, of Fredonia, died April 29, 1974, at the age of 68. He was born February 26, 1906, in Fredonia.

Dr. Beal was graduated from the University of Kansas School of Medicine in 1933. He practiced medicine in Fredonia since that time.

Surviving Dr. Beal are his wife and three daughters.

EARL G. PADFIELD, JR., M.D.

Dr. Earl G. Padfield, Jr., 87, of Salina, died March 24, 1974. He was born July 11, 1887, in Hutchinson.

Dr. Padfield was graduated from the University of Kansas School of Medicine in 1910.

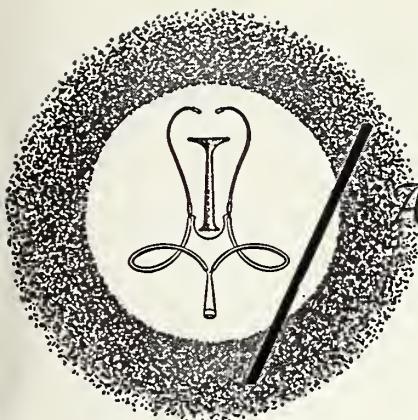
Survivors include his wife, a son, two daughters, and his father. A memorial education fund has been established with the Ophthalmology Department, St. Luke's Hospital, Kansas City, Missouri.

PERRY D. PETTERSON, M.D.

Dr. Perry D. Petterson, of Wichita, died June 1, 1974, at the age of 53. He was born September 6, 1920, in Chanute.

Dr. Petterson was graduated from the University of Kansas School of Medicine in 1944.

Survivors include his wife, a daughter, and three sons.



Announcements

Professional meetings, conferences, and postgraduate courses of national importance are listed for the DOCTOR'S CALENDAR. Notice of the session is posted in advance to allow the physician time to make preparations.

JULY

July 22-24 American Electroencephalographic Society, Seattle: "Current Practice of Clinical Electroencephalography." Write: D. W. Klass, M.D., Mayo Clinic, Rochester, Minn. 55901.

July 28-Aug. 1 National Medical Association, Fairmont Roosevelt, New Orleans. Write: R. D. Watkins, 2109 E St., N.W., Washington, D. C. 20037.

AUGUST

Aug. 12-15 American Hospital Association, Chicago. Write: J. A. McMahon, 840 N. Lake Shore Dr., Chicago 60611.

SEPTEMBER

Sept. 4-6 International Conference on the Physician and Population Change, Stockholm, Sweden. Sponsored by World Medical Association. Write: Sir William Refshauge, Sec. Gen., WMA, 10 Columbus Circle, New York 10019.

Sept. 4-7 American Association of Obstetricians and Gynecologists, Annual. The Homestead, Hot Springs, Va. Write: J. D. Woodruff, M.D., Johns Hopkins Hospital, Baltimore 21205.

Sept. 18-21 Colorado Medical Society, Broadmoor Hotel, Colorado Springs. Write: D. G. Derry, 1601 East 19th, Denver 80218.

OCTOBER

Oct. 10-14 3rd World Congress, Collegijm Internationale Chirurgiae Digestivae, Regency Hyatt Chicago, Hotel. Write: University of Illinois, Surgery Dept., PO Box 6998, Chicago 60680.

Oct. 14-17

American Academy of Family Physicians, Los Angeles Hilton. Write: Roger Tusken, 1740 W. 92nd St., Kansas City, Mo. 64114.

Oct. 19-24

American Academy of Pediatrics, St. Francis and San Francisco Hilton. Write: R. G. Frazier, M.D., 1801 Hinman, Evanston, Ill. 60204.

Oct. 21-25

American College of Surgeons, Miami Beach. Write: C. R. Hanlon, M.D., 55 E. Erie, Chicago 60611.

University of Colorado:

July 15-19 *Internal Medicine*, Estes Park

July 22-26 *Human Genetics*, Aspen

July 28-31 *Pediatrics*, Aspen

Aug. 12-16 *Perinatal Medicine*, Snowmass-at-Aspen

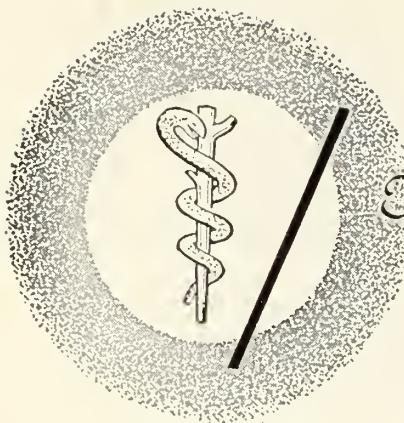
Aug. 19-23 *Nephrology*, Aspen

Aug. 25-29 *Pathology in Gyn-Ob*, Estes Park

For further information, write the Office of Postgraduate Medical Education, University of Colorado School of Medicine, 4200 E. Ninth Ave., Denver 80220.

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The Kansas Press Looks at Medicine

New Directions in Medicine

Of all the professions, medicine to many has seemed among the most tradition-bound. Clergymen and lawyers were the first to become involved in the social ferment of the past decade.

By and large, though, physicians studied and practiced their specialties in the same way. But now the medical profession is in the throes of change, at both the teaching and practicing ends.

The current situation recalls that of 1910, when the Carnegie Foundation issued a report that revolutionized medical education. It led to the abolition of the many small, private academies offering questionable medical diplomas and to formation of the present, university-based system of medical schools. Four years ago, the Carnegie Commission on Higher Education issued another report on medical education, and it promises to have as profound an influence as its predecessor.

The basic thrust of the commission's report was that doctors were becoming over-specialized and were poorly distributed around the country. As a result, many areas faced a crisis of "primary care." The family doctor seemed doomed to go the way of the blacksmith unless medical schools took corrective action.

They have. The number of medical schools in the United States has grown from 84 in 1963 to 114 at present, with others on the drawing board. At least 47 of them offer three-year programs, and virtually all have experimented with curriculum changes. The general aim is to encourage more students to enter family practice and to bring them into earlier contact with practical work.

Many of these innovations resulted from demands by the students themselves. They want less rigidity, less

repetition. They want more work with people—sick people but not cadavers. And they want no part of the time-honored biology "frog." As one student said, "Frogs don't come to your office and ask to be cured."

The new medical school of McMaster University in Hamilton, Ontario, has pioneered the use of "computerized patients." A *Medical World News* writer described how the system works. "When a student sits down at the computer, he is told a list of symptoms and expected to ask a series of diagnostic questions, which are answered in ordinary language. He then prescribes a treatment and immediately gets graphic feedback on its effects: 'Oh! My heart is speeding up! I can't see anymore . . . Doctor, your patient has just died!'"

Inspired, perhaps, by new teaching approaches, today's medical graduates have some new ideas about practice. One emerging specialty is that of "emergency physician"—one who devotes all or almost all of his time to treating patients in hospital emergency rooms.

Emergency room duty once was considered one of the least desirable assignments a doctor could draw. The pace is generally hectic and non-stop, and the variety of ailments demanding treatment runs the gamut of human ills. But that is precisely what appeals to the new breed of medical school graduate. The American College of Emergency Physicians, founded in 1968, now has 4,600 members and hopes for formal certification by the American Medical Association.

Emergency specialists are not motivated entirely by altruism. They are attracted, too, by the short week (usually 40 hours on a regular shift) and by the fact they do not have to rent office space and buy costly equipment. Most important of all, emergency room patients can expect better care.—*The Topeka Daily Capital*, May 8, 1974.

Integument!

Our skin—the human integument—covers us, defines us, protects us. But skin is subject to cuts, burns, abrasions. And infections. Neosporin Ointment fights infection by providing broad antibacterial action against susceptible skin invaders. It contains antibiotics that are rarely used systemically, reducing the risk of sensitization.

INDICATIONS: Therapeutically, used as an adjunct to appropriate systemic therapy for topical infections, primary or secondary, due to susceptible organisms, as in:

- infected burns, skin grafts, surgical incisions, otitis externa
- primary pyoderma (impetigo, ecthyma, syphilis vulgaris, paronychia)
- secondarily infected dermatoses (eczema, herpes, and seborrheic dermatitis)
- traumatic lesions, inflamed or suppurating as a result of bacterial infection.

Prophylactically, the ointment may be used to prevent bacterial contamination in burns, skin grafts, incisions, and other clean lesions. For abrasions, minor cuts and wounds accidentally incurred, its use may prevent the development of infection and permit wound healing.

CONTRAINDICATIONS: Not for use in the external ear canal if the eardrum is perforated. This product is contraindicated in those individuals who have shown hypersensitivity to any of the components.

PRECAUTION: As with other antibiotic preparations, prolonged use may result in overgrowth of nonsusceptible organisms and/or fungi. Appropriate measures should be taken if this occurs. Articles in the current medical literature indicate an increase in the prevalence of persons allergic to neomycin. The possibility of such a reaction should be borne in mind.

Complete literature available on request from Professional Services Dept. PML.

NEOSPORIN® Ointment (POLYMYXIN B-BACITRACIN-NEOMYCIN)

Each gram contains: Aerosporsin® brand Polymyxin B Sulfate 5,000 units; zinc bacitracin 400 units; neomycin sulfate 5 mg. (equivalent to 3.5 mg. neomycin base); special white petrolatum q.s. In tubes of 1 oz. and ½ oz. and ⅓ oz. (approx.) foil packets.



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Research Triangle Park
North Carolina 27709



The Antacid Analogy



Indications: Pro-Banthine is effective as adjunctive therapy in the treatment of peptic ulcer. Dosage must be adjusted to the individual.

Contraindications: Glaucoma, obstructive disease of the gastrointestinal tract, obstructive uropathy, intestinal atony, toxic megacolon, hiatal hernia associated with reflux esophagitis, or unstable cardiovascular adjustment in acute hemorrhage.

Warnings: Patients with severe cardiac disease should be given this medication with caution.

Fever and possibly heat stroke may occur due to anhidrosis

In theory a curare-like action may occur, with loss of voluntary muscle

control. For such patients prompt and continuing artificial respiration should be applied until the drug effect has been exhausted.

Diarrhea in an ileostomy patient may indicate obstruction, and this possibility should be considered before administering Pro-Banthine.

Precautions: Since varying degrees of urinary hesitancy may be evidenced by elderly males with prostatic hypertrophy, such patients should be advised to micturate at the time of taking the medication.

Overdosage should be avoided in patients severely ill with ulcerative colitis.

Adverse Reactions: Varying degrees of drying of salivary secretions may

Therapeutic comparisons in peptic ulcer.

Antacids have only one mode of action to relieve ulcer pain...

Pro-Banthīne® has four. brand of propantheline bromide

Antacids:

Antacids relieve ulcer pain by neutralizing gastric acid. This action is relatively short-lived and they have no other mode of action.

Pro-Banthīne:

Pro-Banthīne suppresses gastric acid secretion. The antisecretory properties of Pro-Banthīne are well established. By effectively blocking vagotonic impulses Pro-Banthīne suppresses gastric secretion to reduce both total and free acid.

Pro-Banthīne helps relieve pain.

Pro-Banthīne relieves ulcer pain by reducing gastric secretion and the motility and spasm of the gastrointestinal tract.

Pro-Banthīne reduces acidity without subsequent acid rebound. The capacity of Pro-Banthīne to reduce the secretion of total and free acid in the stomach has been demonstrated in scores of studies. None has demonstrated any significant evidence of acid rebound.

Pro-Banthīne activity lasts about six hours. The effect of a single therapeutic dose (15 mg.) of Pro-Banthīne lasts about six hours.* Pro-Banthīne P.A., the prolonged-acting form, is active from 8 to 12 hours. Thus Pro-Banthīne may be used to suppress acid, spasm, and pain around the clock, even during the sleeping hours when antacids, to be effective, must be taken almost hourly.

*Innes, I. R., and Nickerson, M., in Goodman, L. S., and Gilman, A. (editors): *The Pharmacological Basis of Therapeutics*, ed. 4, New York, The Macmillan Company, 1970, p. 537.

Pro-Banthīne complements and enhances the action of antacids.

SEARLE

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San Juan, Puerto Rico 00936

Address medical inquiries to: G. D. Searle & Co.
Medical Department, Box 5110, Chicago, Ill. 60680

occur as well as mydriasis and blurred vision. In addition the following adverse reactions have been reported: nervousness, drowsiness, dizziness, insomnia, headache, loss of the sense of taste, nausea, vomiting, constipation, impotence and allergic dermatitis.

Dosage and Administration: The recommended daily dosage for adult oral therapy is one 15-mg. tablet with meals and two at bedtime. Subsequent adjustment to the patient's requirements and tolerance must be made.

Pro-Banthīne P.A.—Each tablet of Pro-Banthīne P.A. (propantheline bromide) contains 30 mg. of the drug in the form of sustained-release or

timed-release beads; on ingestion about half of the drug is released within an hour and the remainder continuously as earlier increments are metabolized. Thus the result is even, high-level anticholinergic activity maintained all day and all night in most patients with only two tablets daily. Some patients may require one tablet every eight hours.

The contraindications and precautions applicable to Pro-Banthīne 15 mg. should be observed.

How Supplied: Pro-Banthīne is supplied as tablets of 15 and 7.5 mg., as prolonged-acting tablets of 30 mg. and, for parenteral use, as serum-type vials of 30 mg.

Before prescribing, see complete prescribing information in SK&F literature or *PDR*. The following is a brief summary.

Indications: Edema associated with congestive heart failure, cirrhosis of the liver, the nephrotic syndrome; steroid-induced and idiopathic edema; edema resistant to other diuretic therapy. Also, mild to moderate hypertension.

Contraindications: Pre-existing elevated serum potassium. Hypersensitivity to either component. Continued use in progressive renal or hepatic dysfunction or developing hyperkalemia. **Warnings:** Do not use dietary potassium supplements or potassium salts unless hypokalemia develops or dietary potassium intake is markedly impaired. Enteric-coated potassium salts may cause small bowel stenosis with or without ulceration. Hyperkalemia ($> 5.4 \text{ mEq/L}$) has been reported in 4% of patients under 60 years, in 12% of patients over 60 years, and in less than 8% of patients overall. Rarely, cases have been associated with cardiac irregularities.

Accordingly, check serum potassium during therapy, particularly in patients with suspected or confirmed renal insufficiency (e.g., elderly or diabetics). If hyperkalemia develops, substitute a thiazide alone. If spironolactone is used concomitantly with 'Dyazide', check serum potassium frequently — both can cause potassium retention and sometimes hyperkalemia. Two deaths have been reported in patients on such combined therapy (in one, recommended dosage was exceeded; in the other, serum electrolytes were not properly monitored). Observe patients on 'Dyazide' regularly for possible blood dyscrasias, liver damage or other idiosyncratic reactions. Blood dyscrasias have been reported in patients receiving Dyrenium (triامترن, SK&F). Rarely, leukopenia, thrombocytopenia, agranulocytosis, and aplastic anemia have been reported with the thiazides. Watch for signs of impending coma in acutely ill cirrhotics. Thiazides are reported to cross the placental barrier and appear in breast milk. This may result in fetal or neonatal hyperbilirubinemia, thrombocytopenia, altered carbohydrate metabolism and possibly other adverse reactions that have occurred in the adult. When used during pregnancy or in women who might bear children, weigh potential benefits against possible hazards to fetus.

Precautions: Do periodic serum electrolyte and BUN determinations. Do periodic hematologic studies in cirrhotics with splenomegaly. Anti-hypertensive effects may be enhanced in post-sympathectomy patients. The following may occur: hyperuricemia and gout, reversible nitrogen retention, decreasing alkali reserve with possible metabolic acidosis, hyperglycemia and glycosuria (diabetic insulin requirements may be altered), digitalis intoxication (in hypokalemia). Use cautiously in surgical patients. Concomitant use with antihypertensive agents may result in an additive hypotensive effect.

Adverse Reactions: Muscle cramps, weakness, dizziness, headache, dry mouth; anaphylaxis; rash, urticaria, photosensitivity, purpura, other dermatological conditions; nausea and vomiting (may indicate electrolyte imbalance), diarrhea, constipation, other gastrointestinal disturbances. Rarely, necrotizing vasculitis, paresthesias, icterus, pancreatitis, and xanthopsia have occurred with thiazides alone.

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*Serum Potassium Level Drops During Long-Term Exercise, *Medical Tribune*, July 4, 1973.

†No implication that 'Dyazide' is useful in preventing K⁺ loss in athletes is intended.

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References: 1. Modell, W., ed.: Drugs of Choice 1970-1971, St. Louis, The C. V. Mosby Company, 1970, p. 196. 2. Goodman, L. S., and Gilman, A., ed.: The Pharmacologic Basis of Therapeutics, ed. 4, New York, The Macmillan Company, 1970, p. 327. 3. Maslansky, L. Paper delivered at Fourth International Congress of Allergology, New York, Oct. 18, 1961; abstracted Excerpta Med. Internat. Congress Series, No. 42, p. 124.

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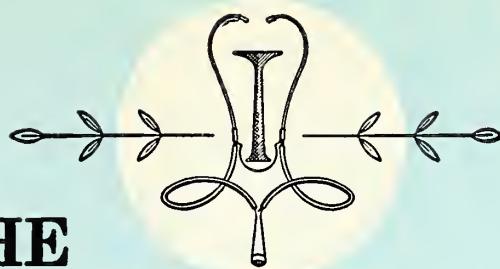
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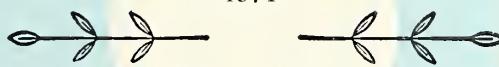
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- Predominant psychoneurotic anxiety
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Before prescribing, please consult complete product information, a summary of which follows:

Indications: Tension and anxiety states; somatic complaints which are concomitants of emotional factors; psychoneurotic states manifested by tension, anxiety, apprehension, fatigue, depressive symptoms or agitation; symptomatic relief of acute agitation, tremor, delirium tremens and hallucinosis due to acute alcohol withdrawal; adjunctively in skeletal muscle spasm due to reflex spasm to local pathology, spasticity caused by upper motor

neuron disorders, athetosis, stiff-man syndrome, convulsive disorders (not for sole therapy).

Contraindicated: Known hypersensitivity to the drug. Children under 6 months of age. Acute narrow angle glaucoma; may be used in patients with open angle glaucoma who are receiving appropriate therapy.

Warnings: Not of value in psychotic patients. Caution against hazardous occupations requiring complete mental alertness. When used adjunctively in convulsive dis-

orders, possibility of increase in freq and/or severity of grand mal seizures require increased dosage of standard convulsant medication; abrupt withd may be associated with temporary in crease in frequency and/or severity of seizures. Advise against simultaneou gestion of alcohol and other CNS dep sants. Withdrawal symptoms (similar to those with barbiturates and alcohol) occurred following abrupt discontinu (convulsions, tremor, abdominal and cramps, vomiting and sweating). addiction-prone individuals under ca

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For further information on this subject, the following references are provided:

1. Henry BW, et al: *Dis Nerv Syst* 30:675-679, Oct 1969.
2. Hollister LE, et al: *Arch Gen Psychiatry* 24:273-278, Mar 1971.
3. Claghorn J: *Psychosomatics* 11:438-441, Sept-Oct 1970.



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veillance because of their predisposition to habituation and dependence. In pregnancy, lactation or women of childbearing age, weigh potential benefit against possible hazard.

cautions: If combined with other psychotropics or anticonvulsants, consider carefully pharmacology of agents employed; drugs such as phenothiazines, barbiturates, MAO inhibitors and other antidepressants may potentiate action. Usual precautions indicated in patients severely depressed, or with latent depression, or with suicidal tendencies.

Observe usual precautions in impaired renal or hepatic function. Limit dosage to smallest effective amount in elderly and debilitated to preclude ataxia or oversedation.

Side Effects: Drowsiness, confusion, diplopia, hypotension, changes in libido, nausea, fatigue, depression, dysarthria, jaundice, skin rash, ataxia, constipation, headache, incontinence, changes in salivation, slurred speech, tremor, vertigo, urinary retention, blurred vision. Paradoxical reactions such as acute hyperexcited states, anxiety, hallucinations, increased muscle

spasticity, insomnia, rage, sleep disturbances, stimulation have been reported; should these occur, discontinue drug. Isolated reports of neutropenia, jaundice; periodic blood counts and liver function tests advisable during long-term therapy.



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The JOURNAL of the KANSAS MEDICAL SOCIETY

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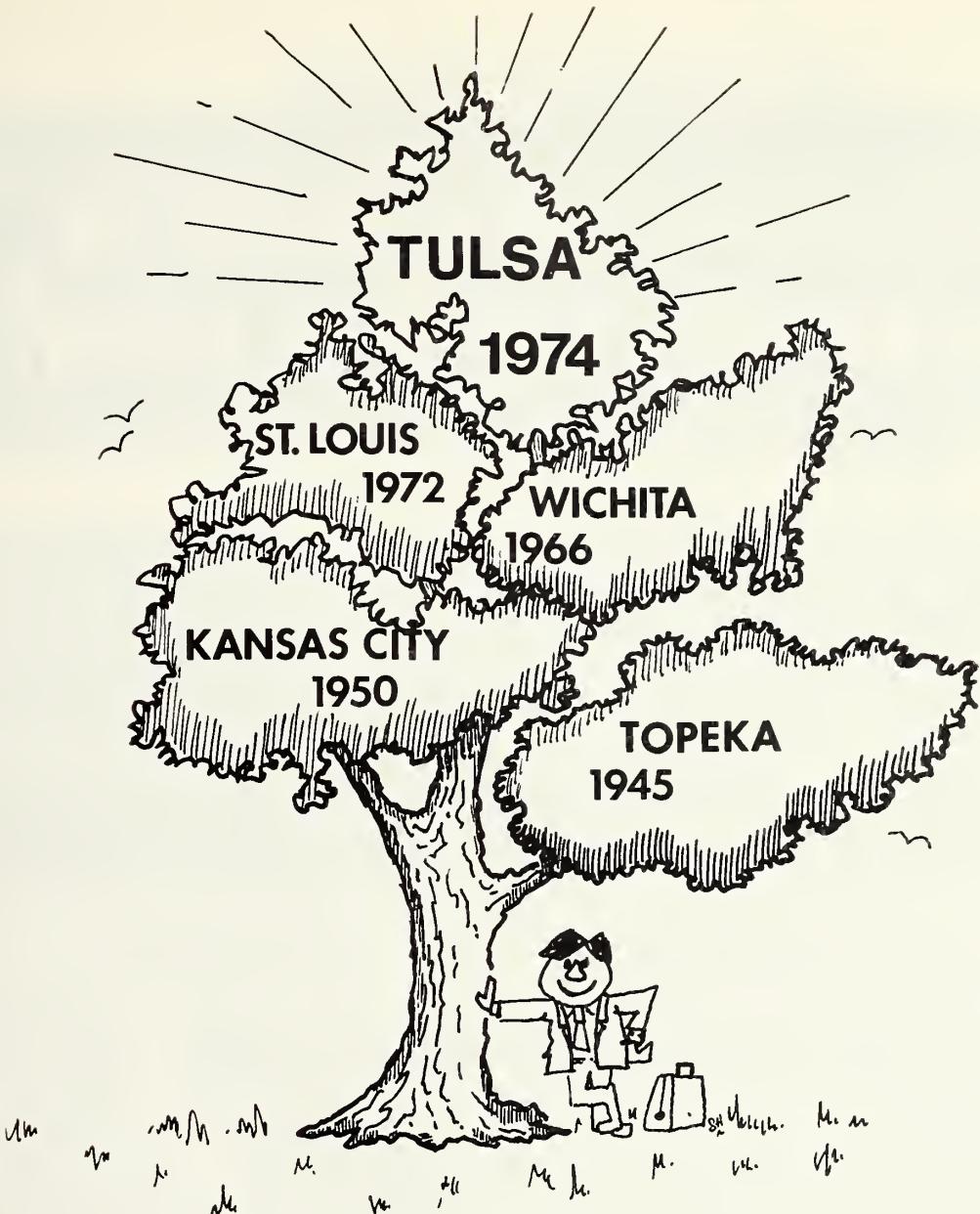
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The Role of the Detail Man



Dr. Willard Gobbell
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"I may be prejudiced, but I am very much in favor of the detail men I meet. Most of them are knowledgeable about the drugs they promote and can be a great help in acquainting me with new medication."

Family Physician's Perception

I think that most general practitioners in this area feel as I do about the detail man. Over the years I have gotten to know most of the men who visit me regularly and they in turn have become aware of my particular interests and the nature of my practice. They, therefore, limit their discussion as much as possible to the areas of interest to me. Since I usually see the same representative again in future visits, it is in his best interest to supply me with the most honest, factual, as well as up-to-date information about his products.

Dr. Jeremiah Stamler
Chairman
Department of Community
Health and Preventive
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"In the total picture of dealing with health problems in this country, there is a potential for detail men to play a meaningful role."

The Positive Influence

My contact with representatives and salesmen of the pharmaceutical industry is the type of contact that people in a medical center, research people, and academic people have and that's in all likelihood on a somewhat different level from that of the practicing physician.

Let me touch on how I personally perceive the role of the sales representative. These men reach large numbers of health professionals. Thus they could be—and at times actually are—disseminators of useful information. They could consistently serve a real educational function in their ability to discuss their products.

At present they do distribute printed material, brochures and pamphlets—some of it scientifically sound and therefore truly useful—as well as some excellent films produced by the pharmaceutical industry. When they function in this

Is He a Source of Information?

Yes, with certain reservations. The average sales representative has a great fund of information about the drug products he is responsible for. He is usually able to answer most questions fully and intelligently. He can also supply reprints of articles that contain a great deal of information. Here, too, I exercise some caution. I usually accept most of the statements and opinions that I find in the papers and studies which come from the larger teaching facilities. It goes without saying that a physician should also rely on other sources for his information on pharmacology.

Training of Sales Representatives

Ideally, a candidate for the position as a sales representative of a pharmaceutical company should be a graduate pharmacist who has a questioning mind. I don't think this is possible in every case, and so it becomes the responsibility

of the pharmaceutical company to train these individuals comprehensively. It is of very great importance that the detail man's knowledge of the product he represents be constantly reviewed as well as updated. This phase of the sales representative's education should be a major responsibility of the medical department of the pharmaceutical company.

I am certain that most of these companies take special care to give their detail men a great deal of information about the products they produce—information about indications, contraindications, side effects and precautions. Yet, although most of the detail men are well informed, some, unfortunately, are not. It might be helpful if sales representatives were reassessed every few years to determine whether or not they are able to fulfill their important function. Incidentally, I feel the same way about periodic assessments of everyone

in the health care field, whether they be general practitioners, surgeons or salesmen.

Value of Sampling

I personally am in favor of limited sampling. I do not use sampling in order to perform clinical testing of a drug. I feel that drug testing should rightly be left to the pharmacology researcher and to the large teaching institutions where such testing can be done in a controlled environment.

I do not use samples as a "starter dose" for my patients. I do, however, find samples of drugs to be of value in that they permit me to see what the particular medication looks like. I get to see the various forms of the particular medication at first hand, and if it is in a liquid form I take the time to taste it. In that way I am able to give my patients more complete information about the particular medications that I prescribe for them.

capacity they are indeed useful; particularly in the fact that they disseminate broadly based educational material and serve not just as "pushers" of their drugs.

The Other Side of the Coin

Obviously, the pharmaceutical companies are not producing all this material as a labor of love—they are in the business of selling products for profit. In this regard the ambitious and improperly motivated sales representative can exert a negative influence on the practicing physician, both by presenting a one-sided picture of his product, and by encouraging the practitioner to depend too heavily on drugs for his total therapy. In these ways, the salesman has often distorted objective reality and undermined his potential role as an educator.

The Industry Responsibility

Since the detail man must be an information resource as well as a representative of his particular pharmaceutical company, he should be carefully selected and

thoroughly trained. That training, however, must be an ongoing one. There must be a continuing battle within and with the pharmaceutical industry for high quality not only in the selection and training of its sales representatives, but also in the development of all of its promotional and educational material.

The industry must be ready to accept constructive as well as corrective criticism from experts in the field and consumer spokesmen, and be willing to accept independent peer review. The better educated and prepared the salesman is, the more medically accurate his materials, the better off the pharmaceutical industry, health professionals and the public—i.e., the patients—will be.

Physician Responsibility

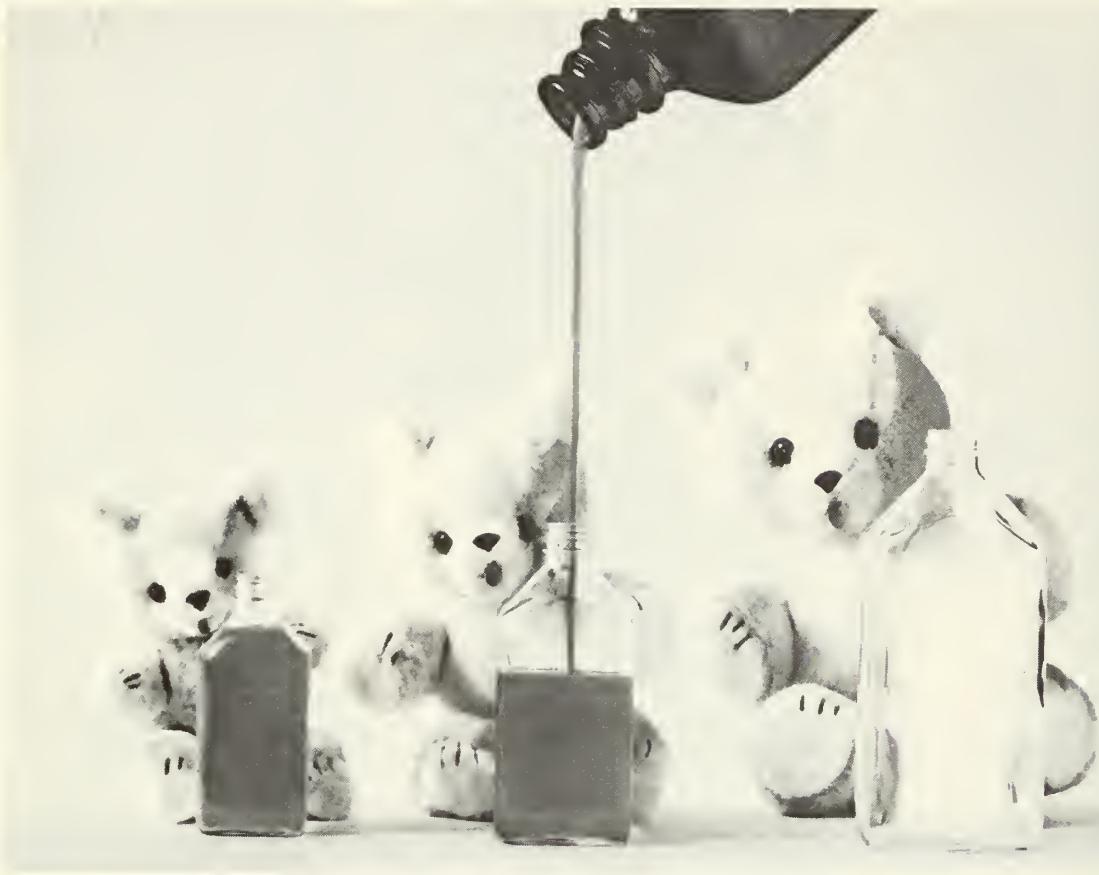
The practicing physician is in constant need of up-dated information on therapeutics, including drugs. He should and does make use of drug information and answers to specific questions supplied by the pharmaceutical representative. However, that informa-

tion must not be his main source of continuing education. The practitioner must keep up with what is current by making use of scientific journals, refresher courses, and information received at scientific meetings.

The practicing physician not only has the right, but has the responsibility to demand that the pharmaceutical company and its representatives supply a high level of valid and useful information. I feel certain that if such a high level is demanded by the physician as well as the public, this demand will be met by an alert and concerned pharmaceutical industry.

From my experience, my impression is that sectors of the pharmaceutical industry are indeed ethical. I challenge the industry as a whole to live up to that word in its finest sense.





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The Dean's Letter—1974

KUMC-Wichita State University Branch

D. CRAMER REED, M.D., Wichita*

IT WAS WITH HUMILITY and enthusiasm that the Wichita State University Branch of the University of Kansas School of Medicine accepted the invitation to join KUMC in the submission of papers prepared by our own faculty members for inclusion in a single issue of the JOURNAL OF THE KANSAS MEDICAL SOCIETY. We are most appreciative of this opportunity to acquaint members of the Kansas Medical Society with "who" and "what" we are.

This initial communication will be relatively brief because, in this day of rapidly changing concepts, any report regarding the current state of the art deals with facts and concepts which are already in a state of flux. The Branch, established by the Kansas Board of Regents in September 1971, received its initial class of 15 students assigned from KUMC in January 1974. In terms of the usual time required for the establishment of similar clinical medical schools, this is a relatively short period during which innumerable academic and administrative tasks must be completed. Even so, much has been done by the six departmental chairpersons and the administrative staff. Of equal significance has been the remarkable cooperation of the over 200 Sedgwick County physicians who have accepted part-time faculty appointments. Fewer than 8 per cent of these physicians receive any reimbursement for their involvement with the teaching program. No "honorary" academic appointments have been awarded; this translates to the fact that each faculty member is or will be directly involved with medical students. Some of these individuals provide as much as 20 hours of contact teaching time per week. Prior to the arrival of students, seven committees, totaling more than 100 community physicians, actively assisted in the development of course objectives and curriculum guides for family practice, medicine, surgery, ob-gyn, pediatrics, and psychiatry clerkships. It is regrettable that space does not permit public identification of each of these devoted men and women for their past and ongoing contributions to the Branch.

Executive Vice-Chancellor Rieke has set forth the rationale for developing a clinical branch at Wichita State University in his annual University of Kansas School of

Medicine report appearing in prior March issues of the JOURNAL OF THE KANSAS MEDICAL SOCIETY. In the interest of space conservation, this data will not be replicated.

Following Regents' endorsement in 1971, and Legislative funding in January 1972, the Branch established certain principles to guide the development, conduct, and refinement of our community-based clinical undergraduate medical education curriculum. The following is a summary of these factors.

1. Commitment to assist KUMC in improving the retention of Kansas physicians. While there is no simple solution to this issue, our long-range goal is to emphasize primary health care and strengthen the rural preceptorship and develop model "outreach" practice concepts. The broad support of ongoing and establishment of needed new graduate medical education programs in Wichita possibly are the most important contributions the Branch can make in this area.

2. Expedited utilization of the full spectrum of Wichita metropolitan area governmental, public, and private health care facilities rather than establishing a free standing university hospital system.

3. Through integrated, interdisciplinary clinical experiences, it is hoped that an improved sense of trust, respect, and understanding of professional roles will emerge between student physicians and other health care professionals. Patients should benefit from improved communication between those responsible for their care.

4. The "finished product" (young physician)—should be academically qualified, but also capable of exhibiting humane concern for his or her patients, and having an understanding of community problems and the socio-environmental elements of illness with which we are all confronted today.

Community Service Programs

The primary responsibility of the Branch is unquestionably that of providing the best possible obligatory and elective clinical clerkships for approximately 120 medical students by 1977. However, it is the conviction of the faculty and staff that there is a compelling responsibility to concomitantly develop consumer-oriented programs for which there is documented need.

* Dean, Wichita State University Branch of University of Kansas School of Medicine, 2221 N. Hillside, Wichita, Kansas 67219.

At present, four such projects are in operation or in advanced stages of development. The first is the Model Cities Neighborhood Health Stations Primary Care Project, conducted cooperatively with the Wichita-Sedgwick County Department of Community Health. In addition to providing health care for approximately 1,000 people, the three health stations also serve the academic function of model ambulatory health centers to which students from the Branch and WSU College of Health Related Professions are assigned for observation and actual clinical experiences upon approval of the patient.

The second public service program is funded through a Kansas Regional Medical Program grant. The Hypertension Screening and Awareness Project is co-sponsored by the Medical Society of Sedgwick County and the Sedgwick County Heart Association. It involves a specially adapted recreational motor vehicle which is scheduled into various areas of the city and county to take blood pressures and perform a health education function relating to hypertension. Citizens with elevated blood pressures are referred to their own physician or, if they have none, to a cooperating physician for followup and indicated treatment. Beginning in July, the screening project team was joined by allied health and medical students from Wichita State and the Branch. Such teams, on invitation of the local county medical society, will travel to communities outside Sedgwick County to assist in screening for hypertension and possibly other selected medical conditions, such as diabetes.

Another planned service-related program is entitled the Physician-Community Awareness Project. This is a cooperative project involving the three Wichita community hospitals and KUMC. Invitations are being extended to spokesmen for medically underserved communities throughout the state, inviting them to participate in the program in Wichita on October 5. The agenda consists of: (1) A half-day discussion of the problems and possible solutions relating to the location of physician(s) in their communities; and (2) Arranging for interested medical students, interns, and residents to visit privately with the various participating community leaders.

Another Branch project is planned for introduction in the fall of 1974. It is designed to provide clinical experiences for Branch medical and College of Health Related Professions Allied Health students. This program will involve carefully supervised inner-city health care delivery and rural community "store front" models. Several Kansas communities, having no physician, have expressed interest in being involved in this project which has the potential of demonstrating the effectiveness of physician extenders (physician's assistant and nurse clinician), as well as other members of the health care team. Another major function of such mini-clinic opera-

tions will be to demonstrate to the student physician the importance of developing managerial skills and learning how to effectively communicate with other health professionals in a "real world" setting.

The Future

It has been said that "there can be no significant innovation in education that does not have at its center the attitudes of faculty; and it is an illusion to think otherwise." The Branch concurs with the accuracy of this statement. Consequently, the goals and priorities identified in a 1972 "white paper" titled, "Statement on Curriculum Development, WSU Branch" are subject to ongoing faculty re-evaluation. (A copy of the WSU Clinical Branch "Statement on Curriculum Development" may be obtained by writing WSU Branch, University of Kansas School of Medicine, 2221 North Hillside, Wichita, Kansas 67219.)

In addition to the continuous review of the Branch objectives and educational methodologies, the faculty and administrative staff are planning several future activities among which are:

Continuing early student exposure to role models of experienced, relevant, dedicated practicing physicians. Inherent to this is recognition of the importance of primary care.

Supporting the development of new types as well as ongoing postgraduate medical education programs presently conducted in the Wichita metropolitan area. The Branch is acutely aware of the enormous rapid advances in medicine. Certain teaching departments are planning for seminars designed to emphasize current medical trends during the next year. In response to frequent requests of area physicians, a broad topic under consideration for early presentation is a series of lectures concentrating on present day basic medical science concepts.

Assisting the two Wichita family practice residency programs to accomplish their respective goals. Basic to this is the recognized need to provide academic and financial support to extend the programs into communities away from Wichita and to experiment with new modes of family practice graduate medical education.

It would be an oversight if this letter did not express sincere appreciation and thanks to the faculty of our sister institution, KUMC, for its cooperative support, and to the many other physicians and area legislators who have supported us so remarkably during this formative period. We have made and undoubtedly will make more mistakes; members of the Kansas Medical Society, however, can be assured that we have learned from them, and will improve with maturity.

New Beginnings

The Wichita State University Branch of KUMC

JOSEPH F. DOMINIC, Ph.D.,* Wichita

MEDICAL EDUCATION LITERATURE is prolific with enthusiasm for widespread change in the preparation of today's physicians and the general delivery of health care services. This enthusiasm obscures, somewhat, the fact that significant change has, indeed, taken place in medical school curricula since the widespread reform movements in universities during the middle and late 1960s. Corresponding with these movements, medical students have since been assuming a large share of responsibility for making sure that their education stays current in providing what they need to function successfully as physicians in a changing world. Examples of this effort are the now highly visible SAMA organization, and publications such as *The New Physician*.

Medical schools too have been generally responsive to the demands for change, as the following examples suggest. One type of innovation which reflects the best cooperative efforts of both students and faculty is the development of courses, such as "Clinical Process" at KUMC, and the growth of departments of human ecology. A primary goal of such courses and departments is broadly based instruction in extra-disciplinary subjects which integrate variously with the total environment of medicine in the modern world. These courses provide opportunities for student exposure and inquiry on a wide range of topics, such as the role of allied health professionals in medicine, problems of aging, human sexuality, medical ethics, and the total environment which produces illness, to cite just a few. These courses generally include some practical clinical experience for students as well. The KUMC Clinical Process course, with imaginative leadership and supervision, appears to be high on the list of students' favorite courses.

Another obvious response to student and physician demands for change in the area of primary care was the addition of family practice clerkships to the clinical curriculum. As a discipline, family practice is now taking energetic strides to entrench itself firmly among the traditional clinical disciplines. One of its chief selling points is its function of correlation and integration among all the medical sciences.

A third example of change stemming from medical

student unrest with traditional learning formats has been the series of efforts to integrate basic science instruction with various organ systems of the body. Harvard was a leader in this innovative venture in 1966-1967. This concept for change was then taken up by several schools and even extended to very daring proportions by the McMaster University (Hamilton, Ontario). However, Harvard's experience turned sour as National Boards results began to show that the students who had taken

Salient features of the KUMC-Wichita Branch programs are reviewed, with attempts to suggest the relationships between the various dimensions of these programs and the primary goals of the Branch.

the organ-system sequence were not doing as well on the National Boards science sections as others who had taken the conventional basic science courses. Critics openly blamed the falling scores on the new curriculum; defenders argued that the reason for the lower science scores was that the National Boards tested for a learning format which Harvard had abandoned in favor of the integrated course. The result of this conflict was indeed major news last fall as Harvard appeared to be reverting to more traditional instruction in the basic sciences.

The most recent development growing out of this whole environment for change has been the community-based clinical education programs, e.g., Michigan State's multi-campus programs in cities such as Grand Rapids; the University of Illinois programs at Rockford and Peoria; and Indiana's multi-campus concept. On the one hand, these programs were pragmatic responses to the demand for increased output of physicians. By utilizing already existing structures and acute care facilities (community hospitals, some involved in graduate medical education, others not), more physicians theoretically could be educated at a lower cost per student. But just as important, these community-based programs were also a response to the demand for increased opportunities in primary care education.

It was in this atmosphere of change that the Wichita

*Director, Student and Program Development.

State University Branch of Kansas University School of Medicine was established and within which it now strives to authenticate itself. While it was true that as a community-based clinical education program the WSU Branch had several models on which to pattern itself, some of its problems, political vicissitudes, strengths, and weaknesses, were unique to Wichita, Wichita State University and Kansas, and as such are not part of this paper. So, it was not desirable to simply borrow the curriculum of an already established community-based program.

The task of developing a curriculum which would provide for the highest quality of professional clinical training and would also accommodate the changing needs of students and the people of Kansas was a subject of much discussion during the year of development (1972-1973). An even larger task centered around strategies for developing in students and faculty humanistic attitudes toward the practice of modern medicine. It should be noted that the word "humane" escaped usage in the previous statement for the reason that it now suffers from over-kill at the hands of many who write and talk about patient care. Besides, it assumes something with which this writer is not yet comfortable, *viz.*, that genuine caring for people can be taught by demonstration. The word "humanistic," on the other hand, relates to a larger context which has a broad historical base. As such, it implies that the acquisition and integration of knowledge and experience is a function of man's mission to strive for the largest possible perspectives on reality. So translated, the term "humanistic" best suits a primary goal of the WSU Branch, *i.e.*, to create an environment in which medical students can have guidance as well as role models for acquiring and integrating knowledge and skills in the following categories: the interrelationships of man, science and technology; the functions, capabilities, and limitations of science and technology; the whole environment in which people become ill, are treated, and recover; external forces which produce change in the physician's world (government, economics, health care institutions, third-party payor, colleagues, patients, etc.); and, finally, the self and its needs, specifically, the need for intellectual and emotional growth in the face of unrelenting and sometimes self-imposed demands upon the physician's time. By having structured experience in these areas, it is hoped that the new physician can be more preventive and problem oriented in diagnosing illness, more efficient and expert in sorting out and providing the most effective forms of treatment, and more sensitive to the human conditions in which illness resides.

It was with these ends in mind that the curriculum for the Branch was shaped. The finished product, which has been operational since January 1974, consists of several

dimensions. First, are the five required clerkships: surgery and medicine—10 weeks each; pediatrics and ob-gyn—eight weeks each; and psychiatry—six weeks. The varying lengths of these clerkships represent the consensus of faculty and practicing physician consultants as to the blocks of time in which each segment of learning could, in their judgment, be adequately and effectively accomplished. These time frames will be subject to change as more experience is acquired in determining the results of our efforts. Each discipline uses newly prepared curriculum guides which specify goals for each segment of the course, as well as required and recommended reading and self-study materials. By design, there is not yet a required clerkship in family practice or community medicine. Because these are areas of growing importance, we feel that the fullest potential of these disciplines must be built into whatever instructional model is used. This is one area in which the Branch hopes to organize interdisciplinary clinical experiences with students from the College of Health Related Professions at WSU.

The first class of 15 students coming to Wichita, after 18 months of basic science education in Kansas City, is presently divided into three groups, with the result that three clerkships are in process simultaneously. In the hospitals, students are under the supervision of members of the faculty and senior house staff and are assigned patients for whom they assume varying degrees of professional responsibility: performing histories and physicals, requesting appropriate lab procedures, diet management, and patient record-keeping. They are required to participate in daily teaching rounds, and attend seminars and special-topic conferences. As such, the form of these clerkships differs little from most other programs, except that students have at least one change of service and frequently a change of hospitals half-way through the clerkships. One innovative element in the psychiatry clerkship, however, is the weekly self-awareness and interpersonal skills seminar. The theoretical base for such a seminar is that aberrations of behavior might best be understood as they exist potentially in each of us. In providing this experience for students, it is the intention of the psychiatry department to develop informed attitudes about human behavior which resist the stereotypic categories to which many physicians assign their problem patients.

A very important process which occurs during each of the clerkships is a multi-dimensional assessment program. Supervised by the office of medical education, this process involves check-list evaluations made by each faculty member who has supervisory responsibility for students. Ideally, every two to three weeks, an evaluation is made regarding the students' interpersonal skills (with patients, colleagues, and superiors) and another

for clinical skills. Students are encouraged to meet with their supervisors subsequent to each evaluation to clarify the responses and have clear understandings about their assets and deficiencies. These evaluation forms are then kept in open files for students to consult according to need. Written examinations vary in frequency; surgery requires one a week, for example, and medicine, one every three weeks. This is a third mechanism for helping students to continually assess their progress. Students are expected to provide assessments of faculty performance also. This is to assist departmental efforts in developing programs of excellence by insuring that the teaching function is consistent with that goal.

A second aspect of the curriculum, the Advisorship, is an attempt to give students the opportunity for supervised private practice experience in settings which realistically reflect the routines, pressures, and rewards of urban primary care. In January, students were assigned to a family practitioner (in most cases) who had previously indicated interest in serving in the role of mentor, counsellor, administrator, friend, and colleague to medical students. For the first six months of their training in Wichita, students spend one afternoon and sometimes an evening assisting the physician in his or her office. Plans now call for students to be given several options for making best use of this open afternoon throughout the remainder of their training in Wichita. They may choose to stay with their advisor-physician for another three months; be assigned to the office of a specialist or another family practitioner; engage in a research project related to a special health interest; become involved in the work of a community service agency. All of these options are an attempt to enlarge upon the student's clinical learning, provide contexts for humanistic attitude development, and sophistication of interpersonal skills, and to create a sense of community awareness. Advisors in this program also do formal evaluations on the activity and performance of students under their supervision.

After completion of their five required clinical clerkships, the students will be required to participate in a four-week preceptorship. Consideration is being given to developing flexible procedures in which the preceptorship setting might vary from private office to satellite clinic, to a mobile health care clinic or "store front" clinic in communities. This is another area in which interdisciplinary clinical experience would be quite effective.

A salient feature of the clinical curriculum is Interphase. This word refers to a concept for extending the goals of the clinical process course taken during basic science at KUMC. The Interphase (the initial orientation period of two weeks for all new students is referred to as Introphase) consists of three week-long

blocks of time, which are interspersed between clerkships. During these periods, all students meet together away from the hospitals in an environment conducive to temporary deceleration and eclectic inquiry. They participate in discussions, seminars, and simulations, they view films and demonstrations on a wide range of topics designed to provide incentives for broadening their capacity for integrated learning, and for adjusting emotionally and intellectually to the growing complexities of medical practice. Three of these sessions have now been completed: an introphase for the first class in January 1974, an interphase at the end of March, and one in mid-July. In general, topics are selected which cut across three major categories: (1) personal and professional growth; (2) the physician and the patient; (3) medicine and the community. The following is a brief description of past interphase activities along with a topic listing for subsequent interphases.

In addition to the conventional orientation activities during introphase (orientation to community, supervisors, facilities, etc.), students first participated in a seminar led by a human relations professional. The subject was personal goals and expectations as a vital ingredient of "winning at life." Along this same line, another session introduced students to the variety of roles which both physician and patient play in any given interview situation. Here students were separated into teams of three, and each had a turn at simulating the roles of physician, patient, and observer. Another seminar was held on the subject of communication problems which develop between patient and physician as the result of the physician's intolerance for the role of the "story" in the patient's description of illness. Students viewed a film in which two brothers' explanations of their respective past conflict with the truth. The story told by the older brother is an attempt to substitute self-gratification for an honest admission of illness. This was discussed from the perspective of the physician's role in recognizing the various ways in which patients construct elaborate stories in which they frequently hide their illness. Another activity provided first-hand experience with one way in which a community provides medical care for the needy. Students were divided into teams of two and accompanied community health nurses on rounds throughout the city for an afternoon. Students reported a more sensitive realization of the important role of the visiting nurse and the dilemmas as well as the health value of this service. In the area of medical science, students were also given refresher courses concerning such topics as fluids—electrolytes and acid-base balance, practical principles of radiology, nutritional intervention, and electrocardiographic interpretation. In addition, there was a demonstration-discussion of emer-

gency resuscitation procedures, and a panel presentation on the physiology of male and female sexuality.

The March interphase was conducted after students had completed their first clerkships. Students participated in seminars on the biology of aging, and on death and dying. The latter included perspectives on cultural, intellectual, and emotional dimensions of death and dying. A practicing Wichita hematologist, whose main concern is for cancer patients, led these discussions. The theme "Medicine and the Community" was discussed in another session by the director of the Sedgwick County Public Health Department. Students spent a morning at the Wichita-Sedgwick County Community Health Center, where they were made familiar with the programs supervised by public health professionals and discussed the impact of such programs as change agents on various segments of the community. In another session, students heard a presentation on some aspects of homosexuality and the predisposition of this type of individual toward becoming a problem patient. Two homosexuals led the ensuing discussion, which focused on behavior-pattern myths which many young people have about homosexuality. The purpose of this session was to allow students to positively process their own feelings about this patient type.

In a subsequent meeting, students participated in a seminar on common ophthalmologic problems which frequently elude accurate diagnosis by the physician. Five patients with various types of eye impairment were present for students to examine under the supervision of two local ophthalmologists. Students were provided another practical experience on the topic of the oral examination. This time, however, an oral surgeon and an otolaryngologist used slides to demonstrate the wide range of diseases and infection processes occurring in the oral cavity. Both these presentations were designed to broaden students' diagnostic skills. One other presentation was made on the subspecialty of aerospace medicine, and another pertained to the upcoming changes in post MD education. Students completed this interphase by attending meetings of the 26th Annual Midwest Cancer Conference in Wichita.

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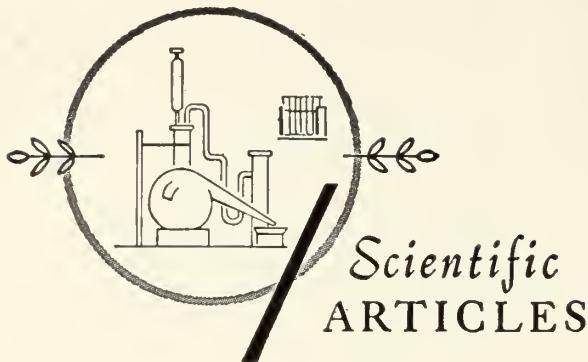
The mid-July interphase focused primarily on topics which relate to the legal, ethical, managerial, and economic aspects of medical practice, as well as personal financial management. While this aspect of the curriculum undergoes continuous modification as needs change, both students and faculty see it as serving a very useful purpose in the overall process of medical education.

It is hoped that this attempt to describe salient features of the Wichita State University Branch, Kansas University School of Medicine, is not taken as complacent satisfaction about what has been accomplished to date. The kinetic nature of these programs requires constant attention to detail and frequent evaluation. It also requires that the students be self-motivating to the extent of taking advantage of the multiple learning environments at their disposal. Above all, it requires constant supervision by faculty to insure that the goals of each program are being accomplished, and that the various needs of our students are being heard and satisfied.

NEW MEMBERS

The JOURNAL takes this opportunity to welcome these new members into the Kansas Medical Society.

D. R. Aleksandrowicz, M.D. 1933 Burnett Rd. Topeka, Kansas 66604	L. H. Jackson, M.D. 2311 West 8th St. Topeka, Kansas 66606
Rene A. Alonso, M.D. 40 Medical Arts Bldg. Topeka, Kansas 66604	M. M. Mani, M.D. K. U. M. C. Kansas City, Kansas 66103
Ariel S. Compton, M.D. The Menninger Foundation Topeka, Kansas 66601	R. E. Morris, M.D. 2824 S. Osage Wichita, Kansas 67217
A. V. Dell'Ario, M.D. 2210 West 15th St. Topeka, Kansas 66604	John D. Moyer, M.D. 202 Medical Plaza Bldg. Topeka, Kansas 66604
D. M. Elder, M.D. 310 Medical Arts Bldg. Topeka, Kansas 66604	C. R. Newton, M.D. 5321 West 49th Terr. Roeland Park, Kansas 66205
R. C. Ganzarain, M.D. 2521 College Ave. Topeka, Kansas 66611	M. P. Pardo, M.D. K. U. M. C. Kansas City, Kansas 66103
D. O. Green, M.D. The Menninger Foundation Topeka, Kansas 66601	B. E. Romalis, M.D. 507 N. Volutsia Wichita, Kansas 67214
Hamner Hannah III, M.D. K. U. M. C.—408C Kansas City, Kansas 66103	David W. Reid, M.D. V. A. Hospital Topeka, Kansas 66622
P. W. Hong Cheung, M.D. 918 West 10th St. Topeka, Kansas 66604	D. E. Schalker, M.D. 5641 West 18th St. Topeka, Kansas 66604
Byravan Viswanathan, M.D. 417 East 6th St. Topeka, Kansas 66607	



Scientific ARTICLES

Aortic Stenosis

Vagaries in Diagnosis in the Adult

ALAN D. FORKER, M.D. and ERNEST W. CROW, M.D., Wichita

UNNECESSARY CONFUSION regarding the cause of a systolic murmur may be avoided by applying one cardinal rule of cardiac diagnosis: the cause of a systolic murmur depends upon the company the murmur keeps. The diagnosis of significant aortic valve stenosis in an adult will rarely be missed if two clinical findings are identified: (1) a slow rising, small volume carotid pulse; and (2) calcification in the aortic valve on chest x-ray or cardiac fluoroscopy. The clinical correlate of the latter radiologic finding is an auscultatory decrease in intensity or total absence of the second heart sound in the aortic area (upper-right sternal border) and apex. Other common, associated features of severe aortic valve stenosis include a palpable sustained left ventricular impulse, and an abnormal electrocardiogram showing left ventricular hypertrophy, especially if ST and T changes are present (so-called "strain effect").¹

However, the associated features may be absent or misleading, and then the proper diagnosis may be overlooked. This is especially true in patients over age 65. Roberts, *et al.*² recently emphasized the atypical features of aortic stenosis in patients of this age group in a retrospective autopsy study. Of 21 patients autopsied, only 10 had the diagnosis of aortic stenosis made during life. However, our experience agrees with that of Finegan, *et al.*³ in that the clinical findings in older patients

are usually quite similar to those in the younger age group; rarely will a diagnosis of aortic valve stenosis be missed if the carotid pulses are properly interpreted, and a calcified aortic valve is excluded by chest x-ray or fluoroscopy with image intensification.

Atypical features occurring in significant aortic stenosis, which may be confusing even in the presence of the serious symptoms of aortic valve obstruction, are discussed.

In this paper, we will discuss those atypical features that may occur in significant aortic stenosis, which have been described in the literature or have occurred in our own experience, which may be confusing even in the presence of the serious symptoms of aortic valve obstruction, especially angina, syncope, or left ventricular failure:

1. With a severely obstructed aortic valve, the systolic murmur may be quite soft and occasionally absent. This is usually secondary to left ventricular failure, with depression of both left ventricular function and cardiac output, with a low stroke volume, and decreased velocity of blood flow across the aortic valve. This type of patient must be examined frequently following therapy, since the murmur may become louder with improvement of left ventricular function. However, the murmur may still remain soft (Grade I-II/VI), and then the damped

From the Department of Medicine, KUMC-WSU Branch, 2221 N. Hillside, Wichita, Kansas 67219.

Address reprint requests to: Ernest W. Crow, M.D., 2221 N. Hillside, Wichita, Kansas 67219.

carotid pulses and the aortic valve calcification are the key findings.

2. A more common systolic murmur in the older age group is a Grade I-III/VI mid-systolic murmur present at the base, with associated normal carotid pulses, wide pulse pressures, normal aortic second sound, without significant aortic valve calcification. This is usually due to aortic sclerosis, in which the murmur results from a fibrotic and thickened aortic valve which is not seriously obstructed.⁴ The clinical findings usually are sufficient to distinguish between the obstructed and non-obstructed valve.

3. The systolic murmur of aortic stenosis may be more prominent at the apex and simulate mitral valve insufficiency; the usual harsh, right-upper sternal border systolic murmur may be relatively inconspicuous. Roberts, *et al.* explained this as a "spray" effect of blood going through a trileaflet aortic valve without a commissural fusion, as opposed to the high-velocity jet effect into the aorta in younger patients, frequently due to bicuspid valves with commissural fusion.² In addition, calcification of the mitral annulus frequently accompanies calcification of the aortic valve in the older age group, and may produce a mitral insufficiency murmur at the apex. When atrial fibrillation and heart failure occur in patients with aortic stenosis, associated left atrial dilatation on chest x-ray may appear, leading to an incorrect diagnosis of mitral insufficiency.

4. Systemic systolic or diastolic hypertension may be present in patients with severe aortic stenosis. One study has emphasized that experienced cardiologists often underestimate the significance and severity of aortic stenosis because of associated hypertension (average cuff blood pressure of 160/105 mm Hg).⁵ In the 1950s and 1960s, it was still taught that the presence of systemic hypertension excluded a diagnosis of significant aortic stenosis.

A very common situation, especially in the elderly, is systolic hypertension, primarily due to the increased rigidity and loss of elasticity of the arterial wall.⁶ Systemic systolic hypertension can decrease the pressure gradient across the aortic valve, and the degree of obstruction may be underestimated as the murmur softens and shortens. There is no correlation between the intensity or duration of the systolic murmur and the degree of aortic valve obstruction.

5. The carotid pulse volume and upstroke may feel normal, even in the presence of serious aortic valve obstruction. This is due to the changes described in the previous paragraph, that is, altered distensibility of calcified, rigid arteries. Generally, however, the delayed carotid upstroke is the most reliable finding, and least likely to mislead the clinician.

6. The aortic closure (second) sound may be audible, even in the presence of severe aortic valve obstruction and calcification. One of the authors has seen a patient with proven severe aortic stenosis who had a very loud, palpable second heart sound, which was documented by phonocardiography and external carotid tracing to be the aortic component of the second heart sound. At the time of aortic valve replacement, two of the three aortic cusps and commissures were severely calcified, but the third cusp and commissure were minimally calcified and appeared mobile, which may explain the loud aortic valve closure.

7. The electrocardiogram may be normal. In one study, 9 of 59 adult patients with severe aortic stenosis, confirmed by cardiac catheterization, had a normal electrocardiogram and no evidence of left ventricular hypertrophy using the Sokolow-Lyon voltage criteria (R wave in lead V5 plus S wave in lead V1 greater than 35mm).⁵ Other electrocardiographic findings may include bundle branch block, prior myocardial infarction, and ST-T changes without voltage criteria for left ventricular hypertrophy.

8. A routine, posterior anterior (PA) chest film commonly shows a normal heart size, since concentric hypertrophy of the left ventricle secondary to a pressure overload usually does not increase the size of the cardiac silhouette. Cardiac dilatation and enlargement do not occur unless left ventricular failure occurs, or there is other associated disease.

9. Aortic valve calcification, identified by cardiac fluoroscopy with image intensification, will usually prevent overlooking aortic stenosis, since severe aortic stenosis is usually accompanied by detectable valve calcification.⁷ However, exceptions do occur. In Roberts, *et al.* series, aortic valve calcification was seen on the PA chest film in only 15 out of 21 patients.² We have seen four patients in whom the presence or absence of calcium led to confusion in diagnosis.

An 80-year-old male had typical clinical findings of severe aortic stenosis but no valvular calcification was seen at fluoroscopy; at cardiac catheterization a 100 mm Hg peak systolic gradient was demonstrated across the aortic valve. Two other men (ages 55 and 65 years) were referred for surgical aortic valve replacement because heavily calcified valves were seen on chest x-ray. Both had normal carotid upstrokes by palpation; neither patient had a significant valvular gradient at cardiac catheterization, and surgery was not performed. Arteriosclerotic coronary artery disease was present in both.

A 54-year-old male had the typical findings of calcific aortic stenosis, including weak carotid pulses and aortic valve calcification. Cardiac catheterization was not performed since it was thought unnecessary. However,

at surgery, the aortic valve leaflets were thin, transparent and normal, and no significant obstruction was demonstrated by pressure recordings. All coronary arteries were severely calcified, and several areas of heavy calcification were present in the commissure between the right and left coronary cusps. The valve was debrided but no replacement was performed.

Thus, even if the clinical findings are typical, even with slow carotid upstroke and aortic valve calcification (which can be confused with mitral valve or coronary artery calcification), we believe that cardiac catheterization is always indicated to document the severity of aortic valve obstruction and to exclude associated disease, particularly arteriosclerotic coronary artery disease in patients with angina pectoris. If some of the findings are atypical, as described in this paper, then thorough evaluation is mandatory.

The proper early diagnosis of aortic stenosis is extremely important, since once symptoms develop, a progressive downhill course follows in spite of good medical therapy. Ross and Braunwald⁸ natural history data showed that the average age at onset of symptoms was 58 years, with the average age at death of 63 years. After the onset of symptoms, the average survival time in patients with angina was five years; those with syncope three years; and in patients with heart failure approximately two years. Patients with heart failure warrant special concern. If the patient has signs of cardiac enlargement and congestive heart failure at the time of aortic valve replacement, the operative mortality will be greatly increased, and the late result in the survivors may be poor due to irreversible myocardial fibrosis.⁹ Thus, the patients with severe aortic stenosis should be operated upon promptly after the onset of symptoms, not only to reduce the risk of death but also to preserve their left ventricular function.

The therapeutic approach to aortic valve disease should not be confused with that of mitral valve disease. Patients with chronic mitral disease often survive for many years, fully controlled by a medical regimen of digitalis and diuretics, without need of cardiac surgery. Only after they reach an uncontrolled class III or IV disability status should they be referred for heart surgery. But, if symptoms of angina, exertional dizziness or syncope, or congestive heart failure appear in a patient with aortic valve disease, even if they respond to digitalis and diuretics, surgical treatment should not be postponed.

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Perinatal Care

Planning for Regionalization in Kansas

DANIEL K. ROBERTS,* M.D., Ph.D., LEONARD A. FARR,† M.H.A.,
RICHARD A. GUTHRIE, M.D.,‡ RUSSELL A. NELSON, M.D.,§ Wichita

SEVERAL FACTORS were influential in formulating the specifics that were adopted in the regionalization of perinatal care: (1) Newborn intensive care units have decreased mortality and morbidity in those neonates fortunate enough to have access to these specialized units; (2) A safe transport system for infants and high-risk mothers from one hospital to another is necessary to afford maximum utilization of a regional perinatal center; (3) Often, the safest way to transport an at-risk infant is in the mother's uterus; and (4) The success of the program depends not only on the expertise available at the regional (Level III) centers, but also, and perhaps most importantly, on the cooperative involvement of physicians in the referral areas of the state.

Through the joint efforts of the departments of Obstetrics and Gynecology and Pediatrics of KUMC at its two branches in Wichita and Kansas City, and Wesley Medical Center, Wichita, the University of Kansas Medical Center in Kansas City, the Kansas Department of Health, and other health care organizations and providers throughout the state, the initial step of a successful regionalized plan, a formal, written plan entitled "Regionalization of Perinatal Care in Kansas" was achieved in early April 1974. The application for funding the initial costs was submitted to the Kansas Regional Medical Program and was given approval by the

Regional Advisory Council in late April 1974. This plan is designed primarily for the first year of implementation of such a program. It is anticipated that this plan will

A comprehensive approach to perinatal care has recently been developed and is planned for immediate implementation for the state of Kansas. The goal of this plan is to decrease maternal and neonatal mortality and morbidity rates and their resulting handicapping conditions.

be developed and modified in subsequent years based upon this first year's experience.

Need

In 1971, in the state of Kansas, there were 36,006 live births and 553 neonatal deaths, yielding a neonatal death rate of 15.4 per 1,000 live births. Of these live births, 212 had congenital malformations at birth and 1,587 were delivered by Cesarean section (1,002 were first C-sections and 565 were repeat C-sections). Of the fetal deaths in 1971, 39 had congenital malformations and 26 were delivered by Cesarean section (23 were first C-sections and 3 were repeat C-sections).

Similar base line neonatal mortality rates have been documented in other states. The improvement in mortality following institution of regionalized newborn care programs is shown in *Table I*. It is likely that such benefits in neonatal survival can be realized by the development of a regionalized perinatal care program in the state of Kansas.

TABLE I
NEONATAL MORTALITY RATES

Area	Before RNC	After RNC
Wisconsin	16.1	9.4
Arizona	14.2	9.2
Salt Lake City, Utah	24.0	10.2

RNC = Regionalization Newborn Care.

Address reprint requests to: D. K. Roberts, M.D., Ph.D., Wesley Medical Center, 550 N. Hillside, Wichita, Kansas 67214.

Dr. James M. Sutherland, Professor of Pediatrics and Director of Newborn Division, University of Cincinnati College of Medicine, stated that:

When the survival and well-being of newborn infants are accepted as worthwhile goals and when medical centers make a major investment toward accomplishing these goals significant achievement follows. The current state of applied knowledge results in surprisingly uniform mortality rates from one such newborn center to another. This experience translated to the U. S. as a whole could decrease newborn death 25 to 30 per cent.

The emotional and financial impact of an avoidable perinatal death is incalculable. The financial impact on society of a single retarded infant requiring institutional care over the individual's lifetime is extremely high.

It was with these facts in mind that the decision was made for a statewide program designed to upgrade maternity and newborn care practices, and to develop the required number of neonatal and obstetrical ICU beds with their utilization based on efficient regionalized planning.

Objectives

The objectives of the regionalization of perinatal care are:

1. Development of an appropriate number and geographic distribution of neonatal intensive care beds, neonatal intermediate care beds, and normal newborn care beds (tertiary, secondary, and primary level centers). Development of similar levels of care for at-risk obstetric patients throughout the state with the appropriate number and geographic distribution of obstetric intensive care beds, intermediate care beds, and normal obstetric beds.

2. Development and operation of effective means of transportation of infants between the three levels of nurseries and supporting communication system; Development at Wesley Medical Center of an effective means of transporting not only the at-risk neonates but also the at-risk mothers, and developing a controlled study comparing the neonatal transport approach at KUMC versus the perinatal transport system at Wesley Medical Center; Development of state-wide perinatal consulting services utilizing the Xerox-400 telecopier system.

3. Updating standards of newborn and maternal care by offering training to primary care physicians and nurses throughout the state in the care of the normal mother and newborn, as well as those requiring transfer to secondary or tertiary care facilities.

4. Development of audio-visual aids to facilitate the training identified in objective 3.

5. Establishment of educational programs for laity

of childbearing age, regarding utilization of secondary and tertiary care facilities.

6. Development of resources for after-care and followup of infants and mothers involved in the program.

7. Planning for development of a data system for evaluating perinatal care in the state and facilitating research related to newborn and maternal care:

7.1 Development of a uniform perinatal information form for state-wide use in transfers of infants and mothers among centers providing different levels of care.

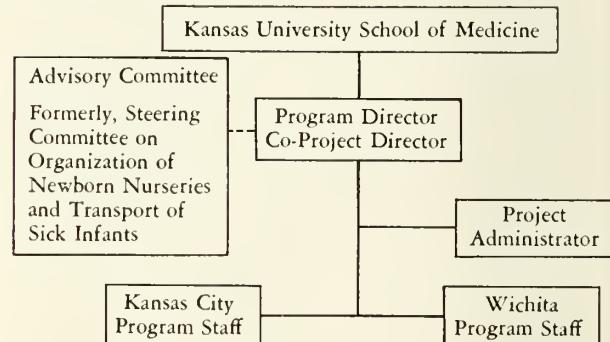
7.2 Development of a detailed timetable and budget for a computerized data system for the state pertaining to perinatal care.

7.3 Establishment of a perinatal clinical research laboratory facility to develop new techniques for assessment of fetal health and to disseminate these techniques to the referral areas.

8. Expansion of the available services in antenatal diagnosis at KUMC to serve as state-wide referral center for this service. Counseling centers will be established at both institutions.

Organization and Implementation

In order to most effectively implement the objectives of the regionalization program, the following organization has been created:



Representatives of the two departments within KUMC, Pediatrics and Obstetrics, will serve as project director and co-project director. The Wichita program will be physically based at Wesley Medical Center and will have a close relationship with the Wichita State University Branch of KUMC.

The creation of two neonatal and obstetrical intensive care centers (tertiary care facilities), one at Wesley Medical Center and the other at the Kansas University Medical Center, will place greater than 70 per cent of all births in the state within a 100-mile radius of one of these facilities. Assuming that 5 per cent of all births in the state require neonatal intensive care with an average stay of ten days each, 40 neonatal intensive

care beds should be required in the state initially. However, based on increased referrals and better fetal survival, this requirement can be expected to increase to a total of 60 beds in the next five years. Twenty to 25 per cent of pregnancies will be in the high risk category requiring special management.

At present, the newborn intensive care unit is completed and operational at Wesley Medical Center. It presently has the capacity for 18 critically ill newborns and plans are being considered to expand to 23 beds in the near future. A definite trend of referring at-risk neonates to Wesley has developed during the past three years (*Table II*).

TABLE II
AT RISK NEONATES REFERRED TO WESLEY

Year	Referred Neonates
1973	47
1972	24
1971	16

The obstetric unit at Wesley is currently equipped to handle the intensive care management of three patients simultaneously, as well as do fetal monitoring of three patients simultaneously. This capacity will be increased to four and four, respectively.

Renovation and equipping of the present premature nursery and neonatal ICU at KUMC has begun, so that an interim unit to care for 20-25 neonates will be available prior to the construction of a new facility. This new neonatal special care center will have an initial bed capacity of 35 for acutely ill neonates, and will include short-term living accommodations for parents of infants transferred from long distances. Expected occupancy is projected for 1976-1977.

Present facilities for intensive obstetric care at KUMC consist of four ICU beds, as well as the capability of fetal monitoring of two patients simultaneously. Two additional labor monitoring units and a central display are already budgeted.

As evidenced, partial achievement of the first objective, *i.e.*, creation of two tertiary care centers (Wesley and KUMC), is well under way. The development of secondary and primary care centers are contingent upon successful implementation of the other objectives.

Transportation and Communication

As noted in the objectives of the plan, the transportation of not only at-risk neonates but also at-risk mothers is a very vital aspect of the perinatal plan.

A major reliance on an effective ground transportation

system of referred at-risk patients will be utilized as 70 per cent of all deliveries in the state occur within a 100-mile radius of either Kansas City or Wichita. Utilization of military air transport, private, or chartered aircraft will be effected where air transport is required.

A specially equipped Intensive Care Unit on Wheels, for both at-risk neonates and mothers, which will be staffed by physicians and specially trained nurses and allied health personnel, has already been purchased by Wesley through a private donation. An Intensive Care Unit on Wheels for neonates has been recently ordered by KUMC. This unit will also be staffed by specially trained physicians, nurses, and allied health personnel.

Both of these units will operate in a radius of approximately 100 miles from their respective centers. The team, upon arriving at the referring hospital, will effect stabilization of the at-risk patient, transfer the patient to the mobile ICU, and will monitor and treat as indicated during the transfer.

Toll-free WATS lines will be maintained at KUMC and at Wesley, so that any hospital wishing to institute transfer of at-risk neonates or mothers will be able to contact an attending specialist on a 24-hour basis. Once a referral is made, these same lines will be used by the physicians in the Level III centers to contact the referring physician on a regular basis to apprise him of the status of his patient. Both KUMC and Wesley, as tertiary (Level III) care facilities, are highly cognizant of the importance of the role of the referring physician and are only supplementing him, not replacing him, in his role as the patient's primary physician.

For the at-risk mother, an additional communication mode is planned. This system will utilize the sending and receiving elements of the Xerox-400 telecopier instrument and in turn will allow a state-wide network of immediate telephone consultation with hospitals containing fetal monitors and this equipment. Eight-minute strips of fetal monitoring information can be sent by a primary or secondary care center and received by the specialist consultant at the perinatal center with resultant advice immediately available to the referring physician.

Data Acquisition, Storage, and Retrieval

As mentioned in the objectives, a data system is being planned which will enable analysis of descriptive data for patient care and research, provide quality control and evaluation of the plan's effectiveness, and provide information which will facilitate future followup care and program planning. The use of a system which will ultimately contain terminals interfaced between primary, secondary, and tertiary care facilities and the Kansas Department of Health is planned. This data system is estimated to be completed within five years.

Professional Educational Programs

This vital aspect can be most effectively developed with emphasis on visitation by specialized physician-nurse teams from the KUMC and Wesley units to the referring communities. Analysis of the spectrum of resources and the unique problems of particular areas will permit design of the most appropriate methods of assisting in each community. Meetings between the teams and local physicians, nurses, and hospital administrators in their own institutions will be designed to suggest the appropriate level of care for each institution. Emphasis in training will be placed on the early recognition of potential or actual problems, thus sharpening criteria for referral. Pediatric emphasis will be placed on altering and updating general standards of newborn care, such as techniques of avoiding hypothermia, techniques for maintaining airway patency, infectious disease control measures, and management of hypoglycemia and hyperbilirubinemia, thus assuring that those infants remaining in primary care facilities are afforded optimal care. Obstetric education, including the criteria for the identification and management of the high risk pregnancy, will be emphasized. Early recognition and therapy in these areas alone can be expected to vastly decrease morbidity and mortality. Guidance for the purchase of equipment to accomplish these goals will be offered.

A library of 35 mm slides and cassette tape recordings or audio-video tapes will be developed to cover a variety of aspects of normal neonatal care and recent advances in the care of the high risk or acutely ill neonate. Copies of these slide-tape and audio-video programs will be distributed to selected hospitals throughout the state to provide a library of information regarding various aspects of neonatal care.

In the neonatal education program as visitation of the hospitals progresses, designation of certain institutions as secondary care facilities will be made. One of the most important determinants for designation of secondary care facilities will be the availability of a pediatrician on a 24-hour basis. Additional educational programs and an expanded budget for equipment will be developed for these institutions. Pediatricians in practice, who are willing to assume responsibility for operation of nurseries in the secondary care hospital, will be invited to spend a period of seven to ten days at KUMC or Wesley for an intensive neonatal training program. During this period, the physician will actively participate in the management of the patients in the neonatal ICU at these institutions, and learn the necessary techniques for operation of the secondary care facility. Nursing staff from the same institution will then spend a one- or two-week period of on-the-job training at KUMC

or Wesley. Following this, a regular schedule of visits between the medical and nursing staffs of secondary and tertiary facilities will be established in order to maintain the required level of skills.

Education in perinatal obstetrics will be implemented by a circuit type course, including information on the use of antenatal studies available for identification of chromosomal and hereditary disorders in-utero. The accessibility of this service and referral methods will be further implemented by preparation of a mailable brochure for state physicians.

The identification of high risk pregnancies and appropriate evaluation and management of such gravidas will be the basis for professional education programs by each of the obstetric departments, and each will be responsible for the perinatal education programs in their respective referral areas. The primary approach in physician education will be in circuit type courses and perinatal team visitation to the secondary or primary unit. Areas of emphasis will be in recognition of high risk mothers, outpatient antepartum management, medical and surgical complications of pregnancy, evaluation of fetal well-being and fetal maturity, care of the high risk and acutely ill mother in labor, utilization and interpretation of fetal monitoring devices during labor, and immediate neonatal care.

Perinatal obstetric nurse training will deal with the same subjects, but will originate with a concentrated period of two to three weeks study in the tertiary center. Four such courses will be offered during the first year with subsequent followup visits by the perinatal team to the secondary or primary facility, where the nurse works to integrate her new skills with the needs of the local staff and to update the physicians on the skills of the newly trained nurse.

Interested medical and nursing personnel within the state will be advised of the rounds and conferences in the perinatal ICUs at KUMC and Wesley, where their attendance will be welcomed. Seminars and one- to two-day courses on aspects of perinatal care will be offered at the perinatal centers.

Conclusion

Complete cooperation of all involved parties, *i.e.*, private physicians, hospitals, medical centers, nurses, allied health personnel and all other providers in the health care arena, is necessary for the success of this program. With this cooperation, the objective of decreasing both maternal and neonatal morbidity and mortality in the state of Kansas can be met in a manner that is both medically comprehensive and expeditious.

Digitalis Toxicity

Neurologic Manifestations

STEVEN MILLER, M.D.* and ALAN D. FORKER, M.D.,** Wichita

DIFFERENTIAL DIAGNOSIS of an acute brain syndrome or delirium should always include drugs, even cardiac drugs such as digitalis. This is emphasized by the following case summary of digitalis-induced delirium.

Case Presentation

A 65-year-old white male was admitted to the hospital on April 5, 1973. He was referred to a cardiac surgeon for consideration of permanent pacemaker placement. When the patient was first seen, a thorough history was not possible because he appeared mentally confused, extremely lethargic, was very slow to respond to verbal and painful stimuli, and his wife related a marked personality change over the past week. No convulsion had occurred. The family had been told that the patient had "heart block," and that a pacemaker was needed because of the poor central nervous system (CNS) function. No history of prior mental disorder or alcoholism was obtained from his wife.

Initial physical examination revealed a moderately obese male, 183 cm (6 ft) tall, weighing 213.6 kg (230 lb). Initial blood pressure was 160/104 mm Hg. By the third hospital day, further blood pressures were consistently normal without treatment. Apical heart rate on admission was 100 beats per minute, with the rate varying between 50 and 86 beats per minute over the next 48 hours. Electrocardiograms showed the rhythm to be atrial-ventricular dissociation, with the ventricular rate greater than the atrial rate, and no evidence of atrioventricular (A-V) block. The patient showed no objective evidence of cardiovascular disease, with no cardiac enlargement, gallop sounds, or murmurs. The liver was palpable 4 fingerbreadths below the right costal margin and nontender. Bilaterally atrophic testes were present with a history of mumps infection as a child. Neurological consultation revealed no specific or localizing neurological findings. The remainder of the physical examination was unremarkable.

Routine admission laboratory data was normal. BUN 8 mg/100 ml, serum potassium 4.1 mEq/L, serum sodium 145 mEq/L, and a chest x-ray was unremarkable with normal heart size. Liver function tests were abnormal: SGOT, 59 units; alkaline phosphatase, 3.14 units (normal up to 2.3 units); BSP retention, 15 per cent at 45 minutes. Isoenzyme alkaline phosphatase determination revealed that the majority of activity was of hepatic origin. Liver biopsy was not performed. The serum creatinine was 1.1 mg/100 ml, with creatinine clearance of 53 cc per minute.

Skull x-rays and radioactive brain scan were negative. An electroencephalogram was abnormal, with the following interpretation: Abnormal electroencephalogram with diffuse, bilateral 4-7 cycle per second and 2-3 cycle per second delta activity. This diffuse, slow activity varies at times to one side or the other, but generally appears to be most marked in the right posterior quadrant. Supraimposed on this diffuse, slow activity are symmetrical bursts of 2-3 cycle per second delta activity, which are most marked frontally. This combination of abnormalities would suggest the possibility of a deep, posterior fossa lesion, perhaps with diffuse cerebral disease in addition.

The day following admission, a markedly elevated serum digitoxin level of 85 ng/cc was discovered (therapeutic level less than 30 ng/cc). Three days after admission, the patient was noticed to be more confused and less coherent. An electrocardiogram showed Mobitz II second degree A-V block with an atrial rate of 80 beats per minute, ventricular rate of 40 beats per minute. At this point, a temporary transvenous pacemaker was placed and left in position for the next six days.

Four days after admission, serum digitoxin level was 57 ng/cc; the patient's mental function progressively improved thereafter, with return to his usual normal function. He now related that he had been taking digitoxin 0.1 mg for a long time, in addition to some unidentified "high blood pressure pills." However, two months prior to admission, he was told by his physician to increase the digitoxin to 0.1 mg three times daily. And then, seven days prior to admission, he was advised to increase the digitoxin to 0.2 mg three times daily "because his blood pressure was still bothersome." It was

* Resident, Internal Medicine, Wesley Medical Center, Wichita, Kansas 67214.

** Assistant Chairman, Department of Medicine, KUMC-WSU Branch, 2221 N. Hillside, Wichita, Kansas 67219.

Address reprint requests to: Alan D. Forker, M.D., Dept. of Medicine, KUMC-Wichita Branch, 2221 N. Hillside, Wichita, Kansas 67219.

suspected, the patient had confused the identity of his pills and was taking the digitoxin when he should have been taking an antihypertensive medication. He had no further digitoxin intake after April 4, 1973.

The last serum digitoxin level on April 20, 1973, was 35 ng/cc. At this point, the electrocardiogram showed normal sinus rhythm with a P-R interval of 0.20 seconds and non-specific repolarization changes. A repeat electroencephalogram (EEG) on this date revealed a minimal abnormality with some diffuse scattered low voltage 5-7 cycle per second theta activity. This electroencephalogram was vastly improved over the one of April 6, 1973.

Discussion

The non-cardiac symptoms of digitalis intoxication have been recognized since the initial report of Withering.¹ Most physicians recognize that anorexia, nausea, vomiting, and visual complaints—especially abnormalities in color vision, are associated with digitalis intoxication. However, other CNS toxic effects of digitalis are less well known. Neurological symptoms may be the earliest, the most severe, and sole manifestation of digitalis toxicity.²

In addition to visual symptoms, Batterman and Gutner² described the following neurologic manifestations of digitalis toxicity: vertigo, headache, drowsiness, restlessness, irritability, delusions, disorientation, delirium, depression, temporary amnesia, peripheral neuralgia, aphasia, stupor, coma, and convulsions. These symptoms usually were present in older adults.

The most recent study of non-cardiac symptoms of digitalis intoxication was reported by Lely and van Enter.^{3, 4} Visual complaints were present in 95 per cent of 179 patients. Nearly all had difficulties in red-green color perception, with a clinical picture compatible with retrobulbar neuritis. One case of blindness has been previously reported.⁵ Psychic disturbances were present in 65 per cent, usually manifested by bad dreams, restlessness, agitation, drowsiness, fainting, and hallucinations. Delirium was seen in four patients; one patient was admitted directly to a mental hospital.^{3, 4}

In the older literature (1900-1950), it was thought that digitalis delirium was due to decreased cerebral blood flow in older patients, with associated cerebrovascular disease and severe congestive heart failure.⁶ However, note that our patient had no identified underlying cardiac or vascular disease, and really had no need for digitoxin. Also, King⁷ was able to reproduce delirium in the same patient in the absence of heart failure.

Convulsions caused by digitalis toxicity are well recognized in children, but rarely occur in adults.⁸ Experimental studies have proven the potential neurotoxicity of

digitalis glycosides. Red squill is a rodenticide used to kill rats by its convulsant effect. Gold, *et al.*⁹ demonstrated that the convulsant action of red squill is created by its cardiac glycoside content. Dearing, *et al.*¹⁰ described nonspecific histologic degenerative changes (swollen pyramidal cells with vacuolization, degeneration, pyknosis, and satellitosis) in cerebral tissues after calculated toxic doses of digitalis had been administered to cats; these changes were uniformly absent when digitalis was given in therapeutic dosages only.

To our knowledge, only three prior patients have been reported with digitalis intoxication and associated EEG abnormalities. Feuerstein, *et al.*¹¹ reported a 2½-month-old baby with recurrent episodes of apnea with associated convulsions. The EEG abnormalities were polymorphic, with multiple types of patterns seen during the convulsions. The child survived and was alive at age 18 months. Fowler, *et al.*⁸ reported a 19-month-old child who died with convulsions; the EEG showed diffuse slow wave activity. No brain autopsy was performed. Douglas, *et al.*¹² reported a 72-year-old male who complained of transient blackout spells of a few seconds duration. The EEG showed generalized 3 per second spike-and-wave activity, which could be evoked with hyperventilation. A later EEG was normal after withdrawal of digitalis.

It is now known that the mechanism of action of digitalis at the myocardial cellular level is inhibition of membrane sodium-potassium activated ATPase. With inhibition of this enzyme, sodium and calcium accumulate intracellularly. Potentially the same effect may occur in the central nervous system at the neuron cell membrane.¹² With increase of intraneuronal sodium and calcium, membrane instability and irritability may occur, creating delirium or convulsions.

Except for our patient, no prior EEG in digitalis intoxication has been reported in the absence of convulsions. Plus, no prior EEG in digitalis intoxication has been correlated with serum digitalis levels. The serum or cerebrospinal fluid digitalis level necessary for neurotoxicity has not been established.

Summary

In summary, the patient presented in a confused, delirious state associated with a diffusely abnormal electroencephalogram; he had a very high serum digitoxin level (85 ng/cc), and his symptoms were totally reversible following withdrawal of digitoxin. No underlying cardiac disease was present. The common digitalis toxic symptoms of nausea, vomiting, and visual difficulties were absent. The clinical clue to the presence of digitalis

(Continued on page 267)

Duct Stones Present?

Transcystic Duct Operative Cholangiography

GEORGE J. FARHA, M.D.* and
RICHARD N. PEARSON, M.D.,** Wichita

SURGICAL LITERATURE upholds the value of operative cholangiography and the only controversial area is its routine use in all cholecystectomies.¹ Much of the criticism of this procedure is based on the following problems: (1) Prolongation of operative time; (2) Increased risk of injury to the biliary tract; (3) The procedure is cumbersome; (4) False-positive and false-negative results make the procedure misleading; (5) The increased risk of postoperative pancreatitis.

The purpose of this paper is to present a method of operative cholangiography where the above problems are minimized. With the employment of the method to be described, it is the intention of the authors to show how operative cholangiography can be a rapid, safe, simple, and accurate procedure in the armamentarium of the biliary tract surgeon, and that the disadvantages listed earlier should not be a deterrent to its routine use.

Technique

Five hundred consecutive cases of cholecystectomy underwent transcystic duct operative cholangiography in a period from June 1966 to December 1973. All were done through a right paramedian, muscle-reflecting incision. The cystic artery was identified and ligated. The cystic duct was mobilized with its junction to the common duct well visualized. The cystic duct was then divided from the gallbladder, preserving as much length of the duct as possible, and the gallbladder was removed. At this point, an x-ray technician was summoned to the operating room. A 3-0 silk suture was placed through the adventitia of the cystic duct midway between the divided tip and the junction with the common duct. A simple knot was loosely tied in the suture. A small opening was made in the cystic duct distal to the suture and a 15-inch, #18 sterile Intramedic, clear polyethylene catheter attached to a plastic 30 cc syringe

filled with saline, previously checked for air bubbles, was introduced into the cystic duct.

A constant flow of saline was provided by an assistant during placement of the catheter. Care was taken not to cannulate the common duct and, once the desired length of catheter was inserted, the previously

A method of operative cholangiography is presented, which can make it a rapid, safe, simple, and accurate procedure in the armamentarium of the biliary tract surgeon.

placed suture was secured. The saline syringe was discarded and a backflow of bile was allowed until the entire catheter was filled. With bile dripping from the end of the catheter, an air-bubble-free, 30 cc clear plastic syringe with 25 per cent Hypaque® dye was connected to the cannula. A small drop was formed at the tip of the syringe just prior to coupling, to insure a bile-dye interface. Five cubic centimeters of dye were then injected into the biliary tract under low pressure, and at a prearranged signal the anesthetist ceased the patient's respirations momentarily while the first film was taken. While a second film cassette was being placed in the table, 10-15 cc of dye were injected and then a second film was taken.

During the development and reading of the cholangiograms, the gallbladder liver bed was closed when indicated or an appendectomy was carried out when feasible. The cannula was left in place in case additional films should be required. The film and a reading by a radiologist were returned to the operating suite for consideration by the surgeon. If the films were negative, the cannula was withdrawn, the cystic duct ligated, and the duct remnant removed.

Discussion

The prolongation of operative time in several reported series varied from 20-25 minutes.^{2, 3} In this series of 500 patients, the actual operating time was increased by an average of 5 minutes only. The time consuming factor lies in the development and return of the films to

* Professor and Chairman, Department of Surgery, KUMC-WSU Branch, 2221 N. Hillside, Wichita, Kansas 67219; Director of Surgical Education, St. Francis Hospital, Wichita.

** Senior Surgical Resident, St. Francis Hospital, Wichita.

Address reprint requests to: George J. Farha, M.D., 905 N. Emporia, Wichita, Kansas 67214.

the operating room. This can be decreased by having the technician place the first film in the operating table prior to the arrival of the patient, and by coordinating the arrival time of the technician to the operating room at the point in time in which he is needed. With the advent of rapid film developers and dryers, much time is saved over previously reported series when this type of equipment was not in use. As noted, the time spent waiting for films can be usefully employed by closing the liver bed of the gallbladder or doing an appendectomy.

The use of a completely clear (from flange to tip) polyethylene catheter adds two advantages over the use of other types of cannulating devices. The clear polyethylene catheter allows the surgeon to detect any air bubbles in the system and take measures to eliminate them. The use of needles and opaque plastic, flanged catheters provides an area in the system for air bubbles to go undetected and thus increase the risk of false-positive readings once the air bubbles are introduced into the biliary tract. The rigidity and inflexibility of steel needles also increases the possibility of perforating the biliary tract. A #18 clear polyethylene catheter is rigid enough to bypass Heister's valves in the cystic duct without difficulty, yet it is flexible enough not to perforate the cystic or common ducts.

In this series of 500 patients, no morbidity or mortality was attributed to operative cholangiography. There were three perforations, two at the junction of the cystic and common bile ducts and one at the posterior wall of the common duct. These occurred early in the series, were recognized at the time of perforation, and were repaired with no consequences. The mean hospital stay of eight days for routine cholecystectomy was not prolonged in patients undergoing operative cholangiography, thus indicating that the procedure adds no complicating factors.

Other authors have performed operative cholangiography prior to removing the gallbladder.^{3, 4} The method described here advocates the removal of the gallbladder prior to cholangiography, thus making the procedure less cumbersome with the gallbladder out of the operating field. The method is further simplified by mobilizing and preserving the duct insofar as possible, thereby giving the surgeon more of the duct with which to work. Little time is wasted removing the remnant once the cholangiogram is completed.

It is generally accepted that when clinical criteria for common bile duct exploration are used, 50 per cent of choledochotomies will yield negative results. In this series of 500 patients, 2.2 per cent (11 patients) were unnecessarily explored due to false-positive readings of

cholangiograms, and this occurred early in the series before the techniques were perfected. Our incidence of false-positives is in general agreement with other series.^{3, 5} When the accuracy of clinical indications to explore the duct is weighed against the disadvantage of false-positive readings in cholangiography, the discrepancy in accuracy becomes obviously in favor of cholangiography. The most common cause of false-positive readings is usually the presence of air bubbles in the system. The method described in this report adds to the accuracy by its use of a clear system, where air bubbles are detected and eliminated by providing a continuous flow of saline during the cannulating of the cystic duct, and by allowing a backflow of bile into the cannula and insuring a bile-dye interface.

In our series of 500 patients, no overt clinical cases of postoperative pancreatitis could be detected. This correlates well with the fact that hospital stays were not prolonged. Schulenburg,⁴ in over 1,000 cases, and Wilkerson *et al.*⁶ in over 300 cases, were also unable to detect any clinically significant cases of postcholangiography pancreatitis. In this series it did not seem feasible to measure postoperative serum amylase levels, and it is suggested that perhaps these are grounds for future study.

Operative cholangiography adds several advantages which makes the procedure an invaluable one. In this series an incidence of 6 per cent of clinically unsuspected stones were uncovered by cholangiogram. This procedure also demonstrates the number and location of the stones, delineates the ductal anatomy for easier exploration, detects anomalies, tumors, strictures and other pathologic anatomy in the ductal system, and decreases the incidence of unnecessary exploration of the common bile duct required by clinical indications.

Summary

A method of operative cholangiography which is rapid, safe, simple, and accurate has been reported, stressing the use of a clear polyethylene, flexible catheter and syringe; the cooperation and coordination between surgeon, x-ray technician, and anesthetist; the removal of the gallbladder prior to cannulating the cystic duct; and the preservation of length in the cystic duct with removal of the duct remnant upon completion of the procedure. Using this procedure, 6 per cent of the group of 500 patients were found to have undetected common duct stones.

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Digitalis Toxicity

(Continued from page 264)

intoxication was the electrocardiographic finding of A-V dissociation, and later second-degree A-V block.

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Information for Authors

Manuscript Preparation

Manuscripts must be typewritten, double spaced, leaving wide margins. Submit the original, plus one copy if possible.

Title should be short, specific, and amenable to indexing. A subtitle is frequently used to keep the main title short.

Summary: All manuscripts should include a short abstract which is a factual (not descriptive) summary of the work.

Author Responsibility: The author is responsible for all statements made in his work, including changes made by the copy editor. Manuscripts are received with the explicit understanding that they are not simultaneously under consideration by any other publication. Publication elsewhere will be subsequently authorized at the discretion of the Editor.

Galley Proof: To make extensive changes in the article after the text has been set in type may require an additional cost which exceeds the original. The galley proof is for correction of ERRORS, and a rewriting of the article should be done on the original copy BEFORE it is submitted for publication.

Drugs should be called by their generic names; the trade names can be added in parentheses if they are considered important. All *units of measure* must be given in the metric system.

References

Bibliographic references should not exceed 20 in number, documenting key publications. Personal communications and unpublished data should not be included. References should be arranged according to the order of citation, and not alphabetically. All references must be numbered consecutively and all must be cited in the text. Use the style of the AMA publications, giving; name of author, title of article, name of periodical, volume, pages, year.

Illustrations

All material which cannot be set in type, such as photographs, line drawings, graphs, charts, tracings (for preparation of tables, see below) must be mounted on white cardboard. All must be identified on the back as to figure number, author's name, and an arrow indicating top. Legends should be typed double spaced on a separate sheet of paper, limited to a maximum of 30 words.

Drawings and graphs should be done professionally in India ink on illustration board or high grade white drawing paper.

Photographic material should be submitted in duplicate as high-contrast, glossy prints. Color illustrations will be accepted for publication only if the author assumes the cost.

THE JOURNAL will assume the cost of B/W engravings and cuts up to \$35 (or 5 cuts). Engraving cost for illustrations in excess of \$35 will be billed to the author.

Tables

Because tables are set by hand, their cost is comparable to illustrations. A reasonable number of tables are allowed without cost to the author.

Tables should be self-explanatory and should supplement, not duplicate, the text. Since the purpose of a table is to compare or classify related items, the data must be logically and clearly organized. The relationship and comparison are established by the correct choice of column heads (captions of vertical columns) and stubs (left entries in horizontal listings).

Each table should be typed double spaced, including all headings, on separate sheets of letter-size paper. Oversize paper should not be used. Instead, repeat heads and stubs on a second sheet for tables requiring extra width. Number tables consecutively. Each table must have a title.

Reprints

A reprint order form with a table covering cost will be sent with the galley proof to each contributor. Since the JOURNAL has no way to provide for reprints, they must be ordered by the author and purchased directly from the printer.

Letters to VOX DOX should be addressed to the Vox Dox Editor, Journal of the Kansas Medical Society, 1300 Topeka Avenue, Topeka, Kansas 66612.

The President's Message

The first meeting of the Subcommittee on Admissions, the University of Kansas School of Medicine, was held on July 17, for the purpose of discussing policies for admission of the medical class for the 1975 academic year.

The organization of the Administrators of American Medical Colleges (AAMC) stresses Early Decision applications. This means that the medical student applies to only one medical school, submitting a complete application with all supporting credentials prior to August 15. The school must give him an early decision, by October 1 (*i.e.*, almost one year before entering school), as to his acceptance or rejection. The agreement is binding on both the medical school and the student. The student is thus "locked in" and cannot apply to any other medical school in the United States until after the early decision has been made on his application. He must attend KUMC if it offers him a place. The Early Decision allows the applicant who is not accepted to be reconsidered at a later date and, possibly, be accepted later. If an applicant is not accepted in Kansas, he can apply to other schools as desired.

Last year at KUMC, of a total 69 applicants interviewed, 33 students were accepted. Please refer to pp. 271-272 for complete listing of early decision interviews; admissions for the past 21 years; the comparative report on admission for the 1974 first-year class; and for MCAT scores and overall grade point averages.

The committee, by agreement, mandated that a medical student for 1975 must have a grade point average of 3.5, and MCAT scores of nothing less than 50 per cent in any category. This decision is subject to review by the Academic Committee.

The ED decisions have been made without the benefit of academic credentials, in the realization that the com-



mittee reviews a select group of applicants. This enables the committee to view the total student, aside from his academic abilities.

A followup report of the Committee on Admissions will appear in the March 1975 issue of THE JOURNAL, at which time the deliberations of the general committee will be presented.

A handwritten signature in cursive ink, appearing to read "John S. Blunk".

President



Editorial COMMENT

Points to Ponder

One of the more interesting phenomena to arrive on the domestic medical scene in recent years is the ancient oriental practice of acupuncture. Avid proponents would deny it is of recent arrival but certainly one can count the interest prior to, say, 1970 as negligible compared with the attention it has received since. In the short time since it took out its first naturalization papers, it has titillated physicians, the public, politicians and, of course, quacks. Just as the prospect of getting something for nothing stirs some sensitive receptors in the primal soul, the idea of getting a beneficial and unexpected effect from a seemingly simple procedure that works beyond the ken entices all of us. Thus have medical, cultural, and political elements combined to present us with new problems and promises.

The background of acupuncture is reasonably concise. Born in oriental antiquity and for centuries an essential demonstration of oriental culture and philosophy, it was rejected by Chinese physicians some 150 years ago, as "westernized" medical practice entered their scene, although it apparently remained alive and well in the rural areas. Although retaining some endemism, it was out of season even in China until Chairman Mao accomplished a nice chauvinistic manipulation by returning it to respectability. In this country, it remained a curiosity of more interest in what it reflected of the Chinese mind and history than in its medical verity.

Then, the round-eyed President and his entourage (including a moderate number of round-eyed journalists) descended upon the Peoples' Republic, whose uniformly happy and productive citizens paused in the reading of their little red books and doing politically significant calisthenics in the town square long enough to impress upon the visitors that needling (*not* western style) and burning appropriate areas of the body were capable of returning the ill and injured to health.

A door slightly ajar is significantly different from one closed and bolted, and the first glimpse of the scene through the newly opened door is apt to be more exciting than any later ones. At any rate, there has been a

growing stream of American visitors to the Peoples' Republic, no small part being physicians seeking to observe the status of Chinese medical practice with special attention to this ancient practice. Only now, after a good many years, is the effort being made, even by Chinese physicians, to determine how it works in terms of our concepts of anatomy and physiology. Though theories abound, no one has discovered this—if, in fact, it is discoverable. True, it satisfies some to discourse on *yin* and *yang* and *te ch'i*, but this does more to emphasize the cultural ambience that begat it than provide the scientific basis which we have (heretofore) required for acceptance of new or different procedures. There must be something special about it, since chiropractors have assured us for years that that old vital energy has to keep flowing to keep us in good health even if they have to resort to their rabbit punches and karate chops to move it along, but the medical profession hasn't been nearly so interested in studying their techniques to find out what they are all about.

The reports of American physician-visitors to China have consistently admired the delivery of medical care to a huge mass of people which formerly had none. The apparent susceptibility of the population to regimentation and authority seems to say something, however, about their suitability as subjects for such a procedure (and at the same time raise some question about the suitability of Americans). Our roving physicians seem to have reacted to the demonstrations of acupuncture in one of two ways—either "Hooray!" or "Wait and see." Journalists and laymen, not restricted by professional skepticism (and not unwilling to put the American medic down a bit), have shown unprecedented interest in—even demand for—instant benefits from the twirl of the needle. Public interest has already been manifest in numerous efforts toward legislative permission of acupuncture even though legislators have had nothing suggesting the basic information necessary to produce suitable laws.

Acupuncture purportedly has two distinct effects. The

more dramatic and, so far, more successful is its capacity to produce anesthesia, and this has been described in terms worthy of a Madison Avenue campaign. There seems to be a familiar ring to this praise and one is reminded of a number of other displacement or dissociative techniques—hypnosis, soft music, and so on—that have been hailed as the answer to pain. There is a suspicion that the ultimate value will be of the same order: acceptable for a certain number of suitable—and susceptible—patients in the hands of a certain number of qualified—and enthusiastic—practitioners.

As a therapeutic procedure (other than that degree of therapy represented by pain relief), no documented reports of success are available, the reports being almost entirely anecdotal. Much effort is being made to bring it into acceptable lines of investigation: objective assessment of the initial condition, accurate recording of method and conditions of use, and critical analysis of results. This is not to imply that acupuncture will fail to meet the test—we don't know—but the type of evidence generally required by the profession is not yet at hand. Acupuncture must be compared with other dissociative or "blocking" procedures. For the most part, it has been used in parallel with other therapies. What risk to the patient if his conventional therapy is withheld during the period of trial? It has not been agreed that the double-blind technique can be validly applied to the study. At this point, we can say only that the case for therapeutic acupuncture, inviting as it is, has not been made—except in the minds of the enthusiasts.

One of the most consistent points made about acupuncture is its safety. Many observers have been assured that complications are nonexistent, a point open to some question since the practitioners have not kept complete records. Certainly the medical profession is aware that such claims can cast suspicion on the whole matter. As a matter of fact, one of the encouraging things about the studies so far is that they show that dangers and complications—and serious ones—do exist, and this, to our devious mind, does more to recommend it than the lavish claims of unblemished success.

On the home front, the matter was subjected to legislative scrutiny at the most recent legislative session, with the chiropractors, predictably, getting into the act and very nearly stealing the ball. Finally, the legislature settled for an act directing the Kansas State Board of Healing Arts to "make a study of the subject and practice" to include "initiation and supervision of experiments." Furthermore, they tell us that acupuncture "means the insertion of needles into the human body by

piercing the skin of the body for the purpose of controlling the flow and balance of energy in the body." (Are you listening, "Dr." Palmer?) And finally, the Board must report its findings at the next session of the legislature.

The situation is snarled further by the fact that the Attorney General has rendered the opinion that the act cited grants to chiropractors the same eligibility to conduct study and experimentation as orthodox physicians (as well as any person authorized by the Board to do so whether licensed to perform one of the healing arts or not). Should the Board return a report favorable to the authorization of the practice of acupuncture in Kansas, guess who's coming to dinner.

There is one facet of the problem which has been largely overlooked and would seem of prime importance. This is the training involved. We are indebted to J. R. Wallace, M.D., Secretary-General of the Canadian Medical Association, whose comments in the *Journal of the Canadian Medical Association* for January 5, 1974, point out that the medical schools in China, in their four-year courses, devote "hundreds of hours" to the teaching of theory and application of this modality. Even with their professional background, Western anesthesiologists are required to take a concentrated six-month course to qualify. In Japan, depending upon the individual's educational background, two to four years are required, and in France, probably the western bastion of the practice, four years of university level training of eight hours a week are required. Yet, Western physicians have rushed to take "quickie" courses given by practitioners of questionable qualification and cash in on the popular interest.

Strict and optimal standards of professional training and qualification would seem to be a *sine qua non* in the acceptance of the procedure. Even if the Board can come up with a meaningful report in the short time available—and it seems a difficult task with the lack of objective scientific evidence at hand—even if we can say unequivocally that this is a worthy and desirable procedure, it is certainly incumbent upon us to determine that the practitioners meet stringent training requirements. Only by such control can we avoid the damage which may be wrought by quacks, whether inside or outside the profession.

Meantime, if faced with the need for surgery, we shall be happy to have a needle twirled into the appropriate spot—providing there is a syringe of Pentothal and a plain old American-style anesthesiologist on the other end.—D.E.G.

(Continued from page 268)

EARLY DECISION—1973

	<i>VA</i>	<i>MCAT</i>	<i>SCI</i>	<i>Premed. SCI.</i>	<i>Overall</i>
	<i>QA</i>	<i>GI</i>	<i>GPA</i>	<i>GPA</i>	<i>GPA</i>
All applicants (69)	51	56	55	3.40	3.40
All Kansas applicants (57)	53	58	56	3.49	3.51
All Non-Kansas applicants (12)	45	47	50	2.95	2.91
Applicants accepted (18)	68	75	73	3.86	3.80
Applicants pended (13)	49	54	56	3.53	3.57
Later were accepted (8)	57	58	57	3.52	3.59
Later were alternates (2)	57	42	46	3.62	3.50
Later were denied (2)	54	38	59	3.37	3.50
Later withdrew (1)	33	78	61	3.83	3.76
Applicants held (38)	43	48	46	3.13	3.14
Later were accepted (7)	47	55	41	3.63	3.51
Oct., 1973 MCAT taken and were accepted (4)	63	49	43	3.63	3.51
Later were alternates (0)					
Later were denied (31)	42	47	47	3.04	3.06

RECORD OF ADMISSIONS TO THE UNIVERSITY OF KANSAS SCHOOL OF MEDICINE
OVER THE LAST 21 YEARS

<i>Years</i>	<i>Total Applications Received</i>			<i>Total Acceptance Letters Sent</i>			<i>Total Enrolled of Those Sent Acceptance Letters</i>		
	<i>KANSAS RESIDENTS</i>	<i>N-KANSAS RESIDENTS</i>	<i>TOTAL</i>	<i>KANSAS RESIDENTS</i>	<i>N-KANSAS RESIDENTS</i>	<i>TOTAL</i>	<i>KANSAS RESIDENTS</i>	<i>N-KANSAS RESIDENTS</i>	<i>TOTAL</i>
1954	173	141	314	97	20	117	90	11	101
1955			354	94	20	114	88	13	101
1956	158	202	360	88	33	121	85	22	105
1957	191	173	364	106	13	119	93	7	100
1958	160	145	305	99	17	116	88	10	98
1959	144	140	284	107	19	126	87	13	100
1960	175	157	332	107	16	123	95	8	103
1961	140	179	319	102	25	127	92	16	108
1962	140	197	337	99	33	132	88	24	112
1963	174	303	477	110	22	132	98	10	108
1964	194	480	664	100	29	129	94	14	108
1965	183	345	528	106	30	136	91	18	109
1966	179	347	526	117	30	147	103	23	126
1967	166	537	703	120	32	152	107	20	127
1968	214	720	934	128	14	142	120	5	125
*1969	273	482	755	142	2	144	124	2	126
1970	255	338	593	143	13	156	125	4	129
1971	307	303	610	158	12	170	137	7	144
1972	356	400	756	172	14	186	146	8	154
1973	368	508	876	167	25	167	147	16	163
†1974	391	607	998	172‡	23	195‡	153	10	163

* Beginning in 1969 a \$15 fee was assessed each N-Kansas applicant.

† As of 7/17/74.

‡ Revisions.

(Continued from page 268)

**ANNUAL REPORT ON ADMISSIONS FOR 1974
FIRST-YEAR CLASS COMPARED TO ADMISSIONS
FOR THE THREE PREVIOUS YEARS**

	1974	1973	1972	1971
Number applicants	998	876	756	610
Kansans	391	368	356	307
Non-Kansans	607	508	400	303
Number students accepted ...	195*	192	186	170
Kansans	172*	167	172	158
Non-Kansans	23	25	14	12
Number withdrawing	32*	29	32	26
Kansans	19*	21	26	21
Non-Kansans	13	8	6	5
Number enrolled	163	163	154	144
Kansans	153	147	146	137
Non-Kansans	10	16	8	7
Number enrolled whose over-all GPA 3.00 or above	152	144	130	128
Percent enrolled whose overall GPA 3.00 or above	93%	88%	84%	89%

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KANSAS DEPARTMENT OF HEALTH AND ENVIRONMENT

As of July 1, 1974, by legislative action, the Kansas State Board of Health was abolished. The Kansas Department of Health and Environment will now be responsible directly to the Governor, through an executive director appointed by him. The director may appoint advisory committees to assist him.

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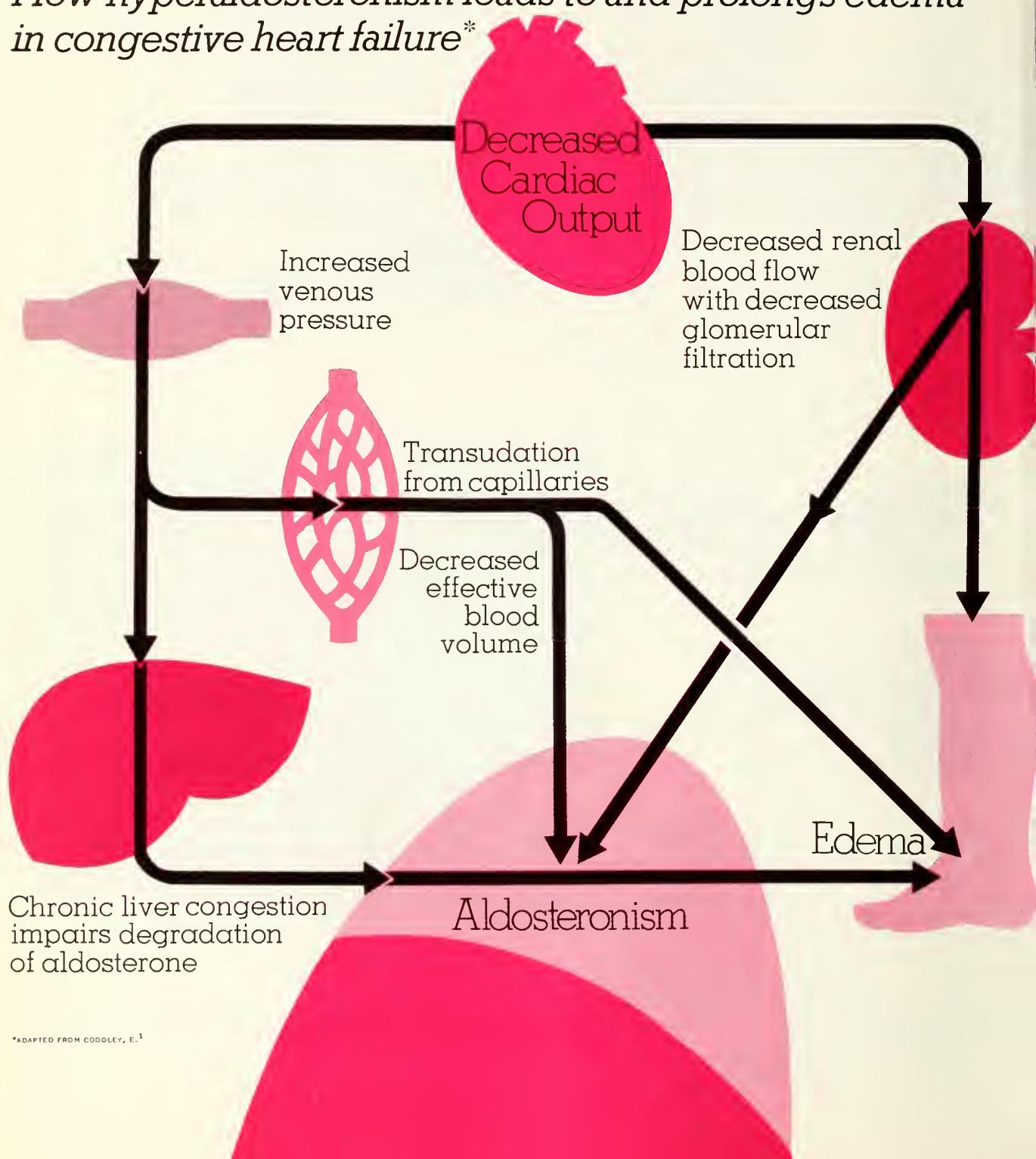
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Indications—Essential hypertension; edema or ascites of congestive heart failure; cirrhosis of the liver and the nephrotic syndrome; idiopathic edema. Some patients with malignant effusions may benefit from Aldactone (spironolactone), particularly when given with a thiazide diuretic.

Contraindications—Acute renal insufficiency, rapidly progressing impairment of renal function, anuria and hyperkalemia.

Warnings—Potassium supplementation may cause hyperkalemia and is not indicated unless a glucocorticoid is also given. Discontinue potassium supplementation if hyperkalemia develops. **Usage of any drug in women of childbearing age requires that the potential benefits of the drug be weighed against its possible hazards to the mother and fetus.**

Precautions—Patients should be checked carefully since electrolyte imbalance may occur. Although usually insignificant, hyperkalemia may be serious when renal impairment exists; deaths have occurred. Hyponatremia, manifested by dryness of the mouth, thirst, lethargy and drowsiness, together with a low serum sodium may be caused or aggravated, especially when Aldactone is combined with other diuretics. Elevation of BUN may occur, especially when pretreatment hyperazotemia exists. Mild acidosis may occur. Reduce the dosage of other antihypertensive drugs, particularly the ganglionic blocking agents, by at least 50 percent when adding Aldactone since it may potentiate their action.

Adverse Reactions—Drowsiness, lethargy, headache, diarrhea and other gastrointestinal symptoms; maculopapular or erythematous cutaneous eruptions; urticaria, mental confusion, drug fever, ataxia, gynecomastia, inability to achieve or maintain erection, mild androgenic effects, including hirsutism, irregular menses and deepening voice. Adverse reactions are infrequent and usually reversible.

Dosage and Administration—For **essential hypertension in adults** the daily dosage is 50 to 100 mg. in divided doses. Aldactone may be combined with a thiazide diuretic if necessary. Continue treatment for two weeks or longer since an adequate response may not occur sooner. Adjust subsequent dosage according to response of patient.

For edema, ascites or effusions in adults initial daily dosage is 100 mg. in divided doses. Continue medication for at least five days to determine diuretic response; add a thiazide or organic mercurial if adequate diuretic response has not occurred. Aldactone dosage should not be changed when other therapy is added. A daily dosage of Aldactone considerably greater than 75 mg. may be given if necessary.

A glucocorticoid, such as 15 to 20 mg. of prednisone daily, may be desirable for patients with extremely resistant edema which does not respond adequately to Aldactone and a conventional diuretic. Observe the usual precautions applicable to glucocorticoid therapy; supplemental potassium will usually be necessary. Such patients frequently have an associated hyponatremia—restriction of fluid intake to 1 liter per day or administration of mannitol or urea may be necessary (these measures are contraindicated in patients with uremia or severely impaired renal function). Mannitol is contraindicated in patients with congestive heart failure, and urea is contraindicated with a history or signs of hepatic coma unless the patient is receiving antibiotics orally to "sterilize" the gastrointestinal tract.

Glucocorticoids should probably be given first to patients with nephrosis since Aldactone, although useful for diuresis, will not directly affect the basic pathologic process.

For **children** the daily dosage should provide 1.5 mg. of Aldactone per pound of body weight.

References: 1. Coadley, E.: Consultant 12:106-107, 109, 111, 113, 115 (July) 1972. 2. Thorn, G. W., and Laufer, D. P.: Am. J. Med. 53:673-684 (Nov.) 1972.

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Open Letter to the Doctors of Kansas

Dear Doctor:

Last month, I wrote why we want your wife to join us in the Auxiliary effort. In this issue, I would like to talk of two interests the Kansas Medical Society and its Auxiliary share and for which we, in the Auxiliary, need the ingenuity, talent, and efforts of your wife to make them successful.

The Immunization Action Month (I.A.M.) is pointed toward the month of October 1974. Even though it seems a long time away, it's important that we begin to plan now to reach maximum effect. With the KMS approval, your Auxiliary will cooperate with the Kansas Department of Health and Environment, and with the regional, county, and local I.A.M. committees. We think this effort to protect 11,000 of the 15,000 children between the ages of 1-4 years, who have not been immunized against diphtheria, pertussis, tetanus, polio, rubella, and smallpox is worthy of our concern, time, and energies.

AMA-ERF is my second concern. Although the contributions by the KMS and its Auxiliary amounted to \$18,000 last year, inflation, increased facilities, larger student enrollment and the KUMC-Wichita Branch stimulate us not to rest on our laurels, but to increase our efforts to surpass the financial support we gave to KUMC last year.

One method that some of the local auxiliaries use to good advantage is the AMA-ERF Sharing Christmas Card. We would like more of the societies and auxiliaries to consider sponsoring this. A committee of the local auxiliary selects the card and the physicians are

solicited. Those wishing to participate make a contribution—all save the cost of the card, postage, and time taken to address them. The physicians' names appear on the card sent to all members of the local medical society (or group designated to receive the card) which states, "In lieu of an individual card, a contribution has been made to AMA-ERF by those persons whose names appear below." The addressing and mailing of the cards is taken care of by an Auxiliary committee.

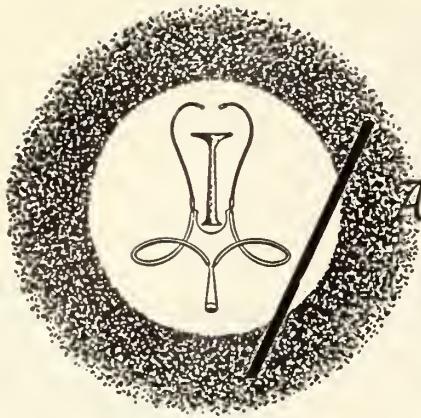
Another successful method used by some auxiliaries is the Professional Art Auction. In some areas, the auction has been combined with a gourmet dinner or wine tasting party. There need be no restrictions on the guest list of either the Christmas card or Art Auction invitation.

I hope that if either of these opportunities are brought to your attention by your Auxiliary, that you will give them serious consideration and encourage or even request them of your wife.

The Woman's Auxiliary to the Kansas Medical Society is aiming for 100 per cent membership. Our work and involvement in I.A.M. and AMA-ERF is because of your encouragement. You can extend your involvement in these and other interesting and stimulating activities through your wife's activity in the Auxiliary.

When she joins us, we can do more together!

Sincerely,
Dot Meyer
President,
Woman's Auxiliary to the
Kansas Medical Society



Announcements

Professional meetings, conferences, and postgraduate courses of national importance are listed for the Doctor's CALENDAR. Notice of the session is posted in advance to allow the physician time to make preparations.

AUGUST

- Aug. 12-15 American Hospital Association, Chicago. Write: J. A. McMahon, 840 N. Lake Shore Dr., Chicago 60611.

SEPTEMBER

- Sept. 4-6 International Conference on the Physician and Population Change, Stockholm, Sweden. Sponsored by World Medical Association. Write: Sir William Refshauge, Sec. Gen., WMA, 10 Columbus Circle, New York 10019.
- Sept. 4-7 American Association of Obstetricians and Gynecologists, Annual. The Homestead, Hot Springs, Va. Write: J. D. Woodruff, M.D., Johns Hopkins Hospital, Baltimore 21205.
- Sept. 18-21 Colorado Medical Society, Broadmoor Hotel, Colorado Springs. Write: D. G. Derry, 1601 East 19th, Denver 80218.
- Sept. 20 Cirrhosis of the Liver. 6th Annual Assembly, St. Francis Hospital, Wichita. Write: Harry E. Hynes, M.D., PO Box 1358, Wichita 67201.

OCTOBER

- Oct. 10-14 3rd World Congress, Collegium Internationale Chirurgiae Digestivae, Regency Hyatt Chicago, Hotel. Write: University of Illinois, Surgery Dept., PO Box 6998, Chicago 60680.
- Oct. 14-17 American Academy of Family Physicians, Los Angeles Hilton. Write: Roger Tusken, 1740 W. 92nd St., Kansas City, Mo. 64114.
- Oct. 19-24 American Academy of Pediatrics, St. Francis and San Francisco Hilton. Write: R. G.

Frazier, M.D., 1801 Hinman, Evanston, Ill. 60204.

- Oct. 21-25 American College of Surgeons, Miami Beach. Write: C. R. Hanlon, M.D., 55 E. Erie, Chicago 60611.

NOVEMBER

- Nov. 11-13 42nd Annual, Omaha Mid-West Clinical Society, Omaha Hilton. Write: Mary E. Pilloud, 1040 Medical Arts Bldg., Omaha 68102.
- Nov. 18-22 American Heart Association, Fairmont Hotel, Dallas. Write: W. W. Moore, 44 East 23rd St., New York 10010.
- Nov. 21-23 Diseases of the Liver (Miami U. postgraduate course), Fontainebleau, Miami. Write: Leon Schiff, M.D., PO Box 520875, Biscayne Annex, Miami 33152.
- Nov. 21-24 Annual Meeting, American Association for Clinical Immunology and Allergy, Ft. Lauderdale, Florida. Write: John L. Dewey, M.D., PO Box 912, DTS, Omaha 68101.
- Nov. 25-27 Treatment and Rehabilitation (American Cancer Society Conference), Waldorf-Astoria Hotel, New York City.

Nov. 30-Dec. 4 American Medical Association, Portland.

University of Colorado:

- Aug. 12-16 *Perinatal Medicine*, Snowmass-at-Aspen
- Aug. 19-23 *Nephrology*, Aspen
- Aug. 25-29 *Pathology in Gyn-Ob*, Estes Park

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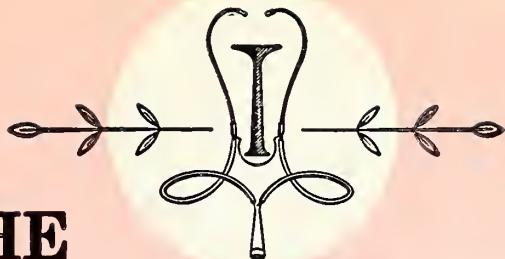
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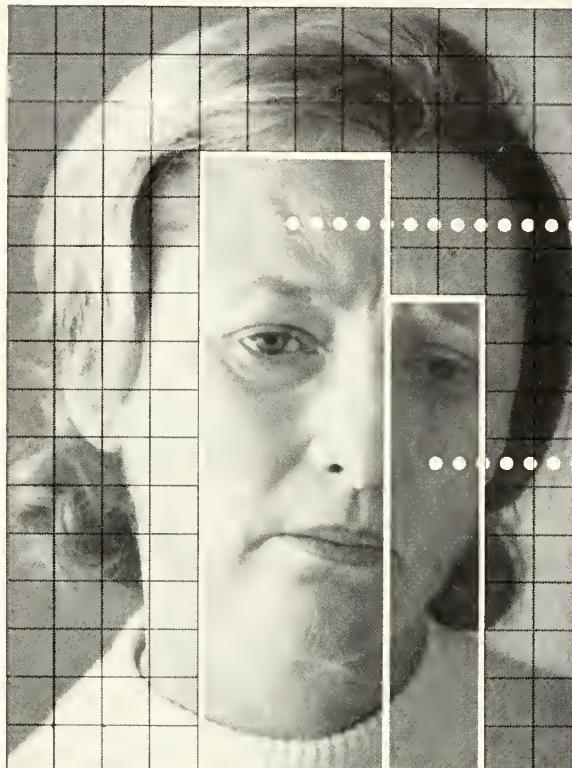
THE Journal OF THE Kansas Medical Society

SEPTEMBER
1974

VOL. LXXV
NO. IX

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Both often



- Predominant psychoneurotic anxiety

- Associated depressive symptoms

Before prescribing, please consult complete product information, a summary of which follows:

Indications: Tension and anxiety states; somatic complaints which are concomitants of emotional factors; psychoneurotic states manifested by tension, anxiety, apprehension, fatigue, depressive symptoms or agitation; symptomatic relief of acute agitation, tremor, delirium tremens and hallucinosis due to acute alcohol withdrawal; adjunctively in skeletal muscle spasm due to reflex spasm to local pathology, spasticity caused by upper motor

neuron disorders, athetosis, stiff-man syndrome, convulsive disorders (not for sole therapy).

Contraindicated: Known hypersensitivity to the drug. Children under 6 months of age. Acute narrow angle glaucoma; may be used in patients with open angle glaucoma who are receiving appropriate therapy.

Warnings: Not of value in psychotic patients. Caution against hazardous occupations requiring complete mental alertness. When used adjunctively in convulsive dis-

orders, possibility of increase in frequency and/or severity of grand mal seizures may require increased dosage of standard anticonvulsant medication; abrupt withdrawal may be associated with temporary increase in frequency and/or severity of seizures. Advise against simultaneous ingestion of alcohol and other CNS depressants. Withdrawal symptoms (similar to those with barbiturates and alcohol) have occurred following abrupt discontinuation (convulsions, tremor, abdominal and muscle cramps, vomiting and sweating). Keep addiction-prone individuals under careful

respond to one

According to her major symptoms, she is a psychoneurotic patient with severe anxiety. But according to the description she gives of her feelings, part of the problem may sound like depression. This is because her problem, though primarily one of excessive anxiety, is often accompanied by depressive symptomatology. Valium (diazepam) provides relief for both—as excessive anxiety is reduced, the depressive symptoms associated with it are also relieved.

There are other advances in using Valium for the management of psychoneurotic anxiety with secondary depressive symptoms: the psychotherapeutic effect of Valium is pronounced and rapid. This means that improvement is usually apparent in the patient within a few days rather than in a week or

two, although it may take longer in some patients. In addition, Valium (diazepam) is generally well tolerated; as with most CNS-acting agents, caution patients against hazardous occupations requiring complete mental alertness.

Also, because the psychoneurotic patient's symptoms are often intensified at bedtime, Valium can offer an additional benefit. An *h.s.* dose added to the *b.i.d.* or *t.i.d.* treatment regimen can relieve the excessive anxiety and associated depressive symptoms and thus encourage a more restful night's sleep.

For further information on this subject, the following references are provided:

1. Henry BW, et al: *Dis Nerv Syst* 30:675-679, Oct 1969.
2. Hollister LE, et al: *Arch Gen Psychiatry* 24:273-278, Mar 1971.
3. Claghorn J: *Psychosomatics* 11:438-441, Sept-Oct 1970.



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in psychoneurotic
anxiety states
with associated
depressive symptoms

veillance because of their predisposition to habituation and dependence. In pregnancy, lactation or women of childbearing age, weigh potential benefit against possible hazard.

Cautions: If combined with other psychotropics or anticonvulsants, consider carefully pharmacology of agents employed; drugs such as phenothiazines, narcotics, barbiturates, MAO inhibitors and other antidepressants may potentiate action. Usual precautions indicated in patients severely depressed, or with latent depression, or with suicidal tendencies.

Observe usual precautions in impaired renal or hepatic function. Limit dosage to smallest effective amount in elderly and debilitated to preclude ataxia or oversedation.

Side Effects: Drowsiness, confusion, diplopia, hypotension, changes in libido, nausea, fatigue, depression, dysarthria, jaundice, skin rash, ataxia, constipation, headache, incontinence, changes in salivation, slurred speech, tremor, vertigo, urinary retention, blurred vision. Paradoxical reactions such as acute hyperexcited states, anxiety, hallucinations, increased muscle

spasticity, insomnia, rage, sleep disturbances, stimulation have been reported; should these occur, discontinue drug. Isolated reports of neutropenia, jaundice; periodic blood counts and liver function tests advisable during long-term therapy.



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The JOURNAL of the KANSAS MEDICAL SOCIETY

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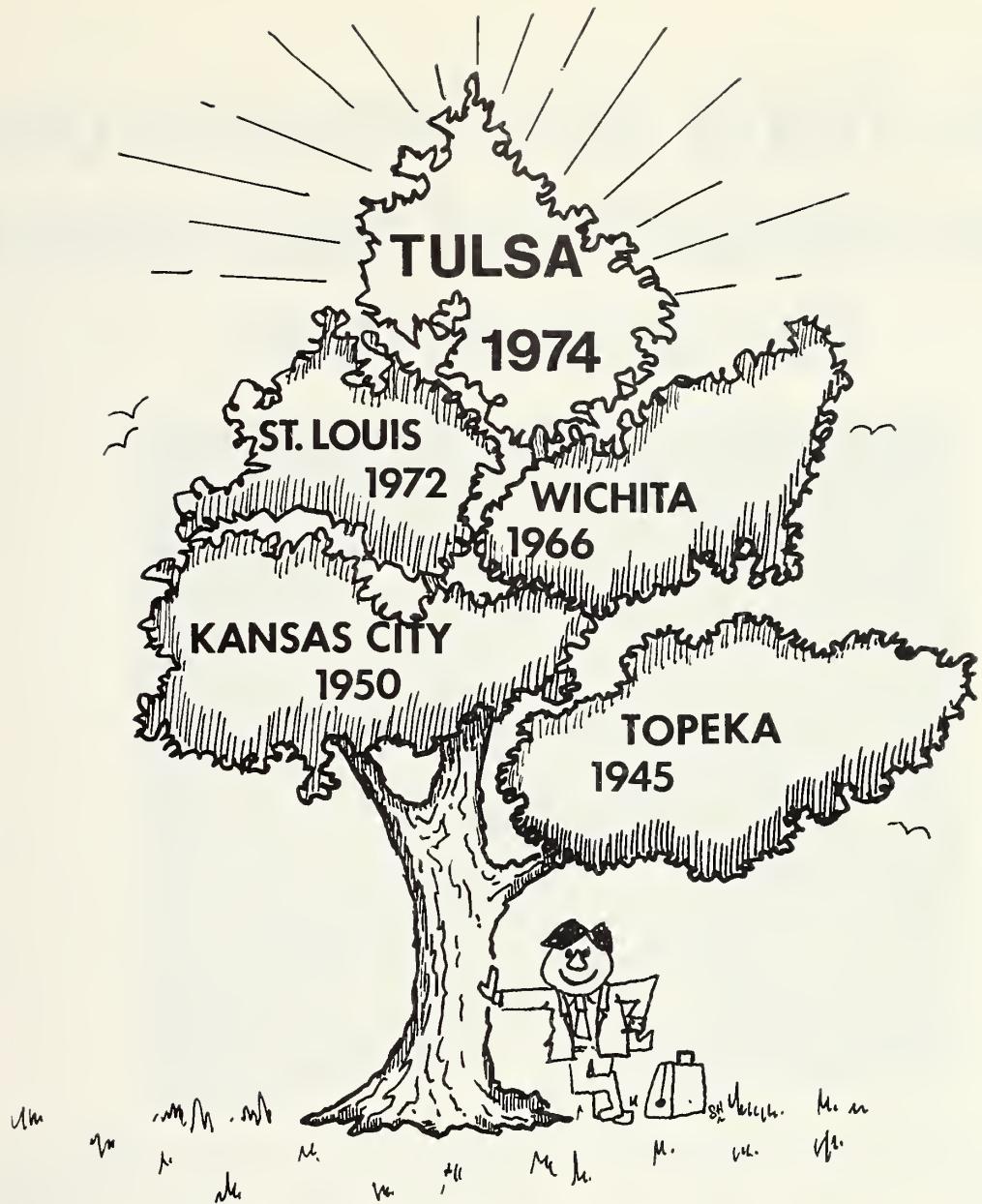
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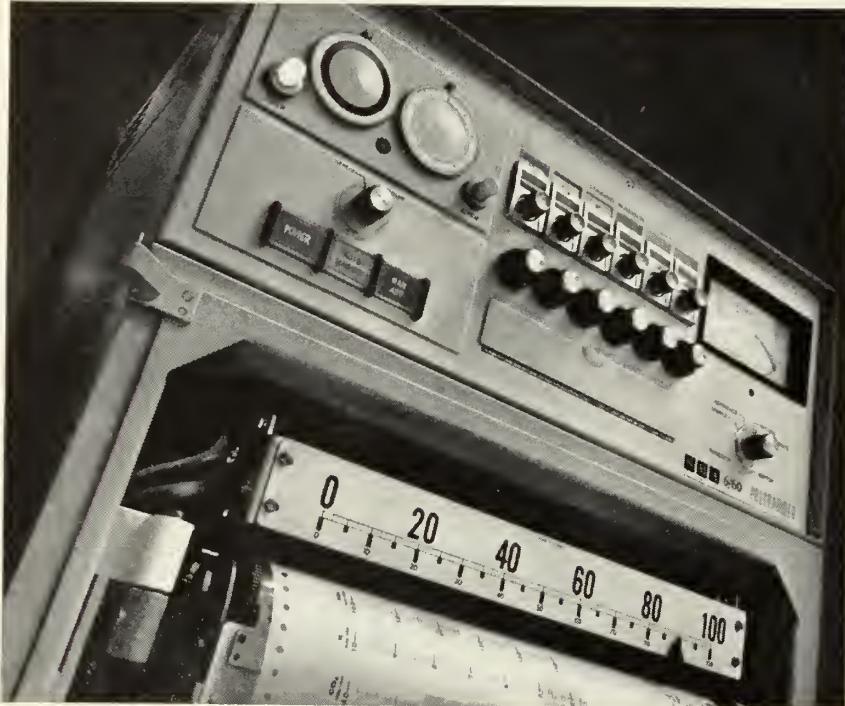
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3. We should have well over 50 percent of the Kansas Medical Society membership as KaMPACKERS, to be better representative of the doctors (presently only 10 percent embellish our grandeur).

4. Our constitution has been revised and amended to reconstitute the Board. It is hoped that by these changes, our medical leaders will feel a greater responsibility toward KaMPAC. The Executive Committee of the KMS from here on will be responsible for appointing board members; for wider participation there will now be an alternate designated for each board member with either or both in attendance at board meetings.

5. As a KaMPACKER, you automatically fall heir to a privileged platform of vast listener exposure, thus enhancing the full force of your explosive expletives!

6. Let it not be said that we are just a hard-hearted herd of tightwadian Republicans. After a careful search through the compiled and unedited KaMPAC minutes for the past ten years, I am privileged to announce the discovery of that one lonely Democrat (and only One) to whom a donation from KaMPAC was sent. Of course, this may have been a simple oversight, but I prefer to pinpoint this amazing instance of generosity (all of \$15.00) as the turning point of our fast falling star. I should hope that this incontestable evidence shall forever seal the lips of those who cherish the charge of partisanship against us!

7. I am pleased to announce from the highest rooftops that by no small skullduggery was I able to entice Dr. Roy Neil (a bona fide Demo of Hays, Kansas) to take up the cudgel and do battle for Naughty Norb's Machine. We are equally pleased to welcome two new members this year from the Ladies Auxiliary: Mrs. Ann Rempel, Wichita, and Mrs. Robert Moore, Caney, Kansas (all new Board members).

8. We need many more KaMPAC members with a healthy balance of the Board, and we are willing to resort to any means to do so, even if it demands telling the awful truth about ourselves. Our political adversaries are not necessarily our enemies; many are our friends, and all deserve our highest consideration if we are to remain a free system of multiple parties.

VALE PAGE, M.D., *Chairman, KaMPAC*

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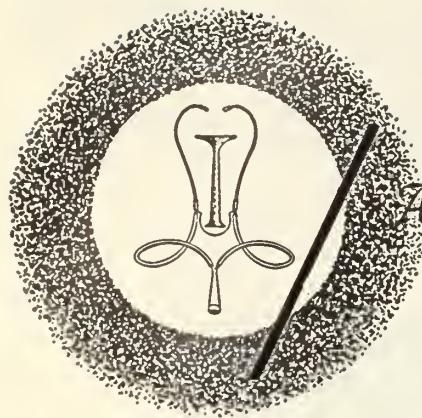
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Dentists, Vets . \$20.00—Regular membership + \$80.00 for sustaining membership

II. Incorporated Doctors

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Announcements

Professional meetings, conferences, and postgraduate courses of national importance are listed for the Doctor's Calendar. Notice of the session is posted in advance to allow the physician time to make preparations.

SEPTEMBER

- Sept. 18-21 Colorado Medical Society, Broadmoor Hotel, Colorado Springs. Write: D. G. Derry, 1601 East 19th, Denver 80218.

- Sept. 20 Cirrhosis of the Liver. 6th Annual Assembly, St. Francis Hospital, Wichita. Write: Harry E. Hynes, M.D., PO Box 1358, Wichita 67201.

OCTOBER

- Oct. 4-5 11th Annual Symposium on Kidney Disease, Hilton Hotel, Denver. Write: Kidney Foundation, 2186 S. Holly, Denver 80222.

- Oct. 10-14 3rd World Congress, Collegijm Internationale Chirurgiae Digestivae, Regency Hyatt Chicago, Hotel. Write: University of Illinois, Surgery Dept., PO Box 6998, Chicago 60680.

- Oct. 14-17 American Academy of Family Physicians, Los Angeles Hilton. Write: Roger Tusken, 1740 W. 92nd St., Kansas City, Mo. 64114.

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- Nov. 25-27 Treatment and Rehabilitation (American Cancer Society Conference), Waldorf-Astoria Hotel, New York City.

- Nov. 30-Dec. 4 American Medical Association, Portland.

INTERNAL MEDICINE COURSES

The American College of Physicians (ACP) will sponsor the following postgraduate courses:

- Oct. 2-4 Current Concepts of Clinical Hematology; U. of Virginia Medical School, Charlottesville.

- Oct. 7-9 Clinical Course in Nephrology; Royal Victoria Hospital, Montreal, Quebec.

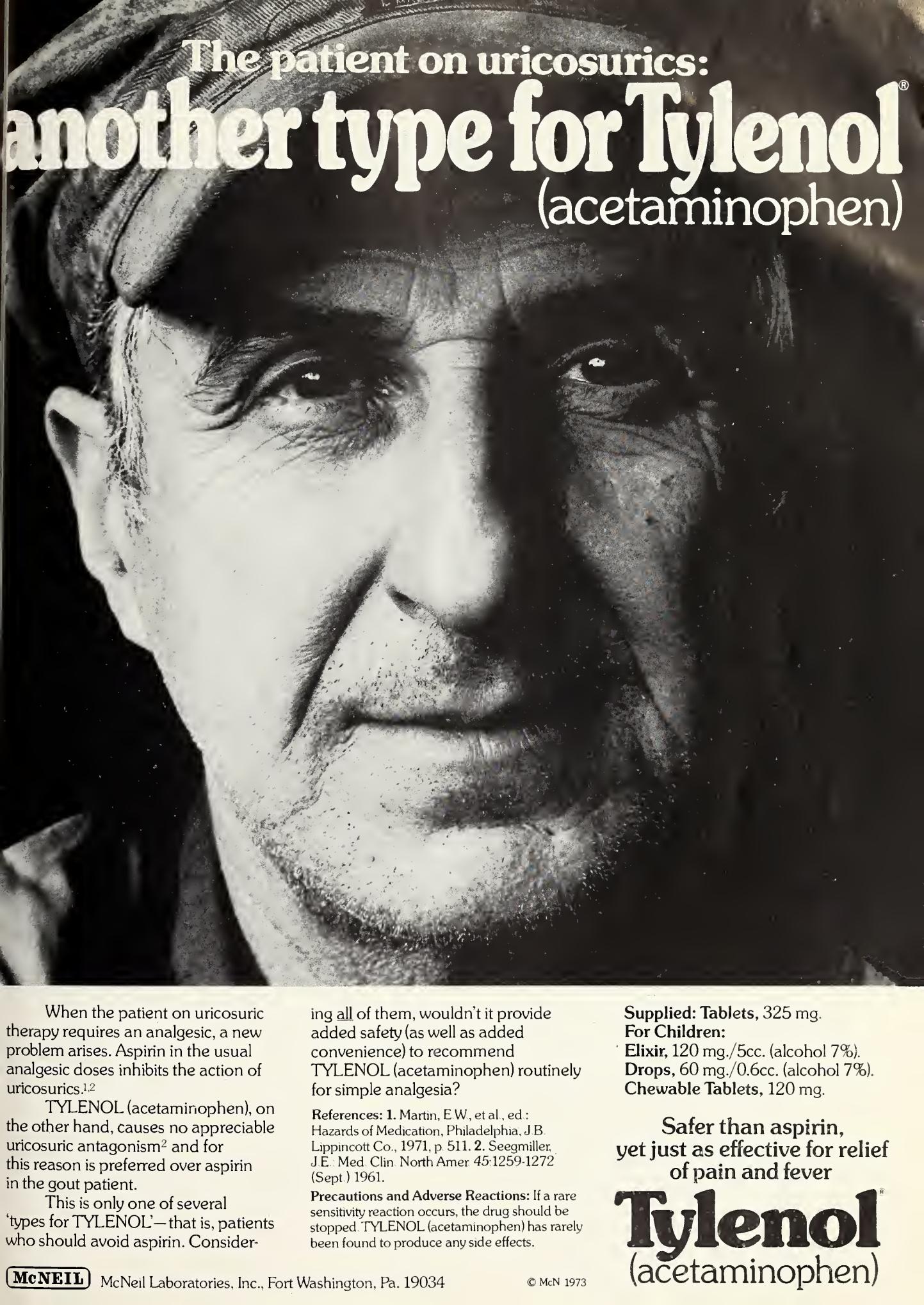
- Oct. 21-25 New Developments in Diagnosis and Treatment of Disease with Radionuclides; U. of Michigan Towsley Center, Ann Arbor.

- Oct. 21-25 Rheumatic Diseases; Jummy Fund Auditorium, Children's Hospital Medical Center, Boston.

- Oct. 24-26 Valvular Heart Disease; U. of New Mexico, Albuquerque.

- Oct. 28-31 Crisis Medicine; Hyatt House, Albany.

For information, write: Registrar, Postgraduate Courses, ACP, 4200 Pine St., Philadelphia, Pa. 19104.



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References: 1. Martin, E.W., et al., ed.: Hazards of Medication, Philadelphia, J.B. Lippincott Co., 1971, p. 511. 2. Seegmiller, J.E.: Med. Clin. North Amer. 45:1259-1272 (Sept.) 1961.

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Open Letter to the Doctors of Kansas

Dear Doctor:

During this month and until November 5, many of our Auxiliary members will be active in political campaigns. As a rule, most of their time is spent in volunteer services like this or in hospital auxiliaries, PTA, or other social agencies. Women's effort in all of these fields is applauded as most valuable. You, Doctor, are married to one of the brightest and most capable ladies in your community, as if you didn't already know. I'm sure you are proud of them and their efforts.

One of the objectives and goals of the Medical Auxiliary is to keep your wife and those of all Kansas doctors informed about community needs dealing primarily with health issues and medical political issues. We also hope to help them in selecting their choice of service areas.

In political activity, LEGS, our legislative committee, is an organized pyramid, formed to get your message to our state or national legislators. Our pyramid spreads into all organized areas of Kansas, and is available for state and national legislative effort. However, we respond as the organized LEGS only when we are asked

by the Kansas Medical Society or the AMA—only when you ask, Doctor.

It has been said that it is easier to qualify for PTA than for Medical Auxiliary. You select our members, Doctor. You select that type of lady with a singular blend of intelligence, education, talent, energy, enthusiasm, fun, and altruistic concerns that we want and need in Auxiliary. If each of the 90,000 members of the Medical Auxiliary on the national picture were to volunteer one hour of service a day, it would represent as much power as 11,000 full-time workers . . . as many as are employed by a company the size of Eli Lilly.

If all the wives of Kansas physicians were involved in their county and state auxiliary, think how much more we could do together.

Sincerely,
Dot Meyer
President,
Woman's Auxiliary to the
Kansas Medical Society



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AMA House of Delegates

Summary of Actions Taken at the 123rd Annual Convention, Chicago, Illinois, June 23-27, 1974

The following report was prepared and submitted to THE JOURNAL by George E. Burkett, Jr., M.D., Overland Park, and Clair C. Conard, M.D., Dodge City, AMA Delegates from Kansas, who both attended the meeting in Chicago, appeared before the reference committees, and acted upon all the business submitted to the House.

Elections

President-Elect: Max Parrott, M.D., Portland, Oregon
Vice-President: Joseph M. Ribar, M.D., Alaska

Speaker: Tom E. Nesbitt, Tennessee

Vice-Speaker: William Y. Rial, Pennsylvania

Trustees: Daniel Cloud, Arizona; James M. Blake, New York; Hoyt D. Gardner, Kentucky; Raymond T. Holden, District of Columbia; Frank J. Jirka, Illinois; Joe T. Nelson, Texas

Judicial Council: Samuel R. Sherman, California

Council on Constitution and Bylaws: Urban H. Ever sole, Massachusetts; Herman J. Smith, Iowa

Council on Medical Education: Richard G. Connor, Florida; Joseph White, Jr., Pennsylvania; Charles Verheyden, Minnesota

Council on Medical Service: John G. Morrison, California; Paul W. Burleson, Alabama; Robert T. Kelly, Minnesota; Douglas Hiza, Iowa.

Address of Vice-President of the U.S.

Though it had been rumored that Ford would address the PSRO issue, his only passing reference was:

"I've been getting a lot of free advice lately on how to run my business. I have not necessarily followed this advice. So, I won't give you any free advice on how to run your business. In my view on PSRO, (p)oliticians (s)hould (r)eain (o)ut of it."

Turning to confidentiality, Ford said that "while ways must be found to minimize federal involvement in health care delivery while achieving an effective private/public health care partnership, it is essential that we avoid bureaucratic intervention between the doctor and his patient—intervention that compromises the rights and privacy of both."

Malcolm C. Todd, M.D., AMA President

In his inaugural address, Dr. Todd stated, "It is high time to put the health care state of the Union into

its true perspective, before lack of perspective leads to waste of effort, waste of money, waste of hope."

Dr. Todd asked the delegates to consider sponsoring a National Academy of Health to formulate his proposed national policy. The academy, he said, would give both private and public sectors of health care "an open forum and framework in which to exchange views, pinpoint health care needs, evaluate total health care resources, and arrive at some common sense of purpose, with sound programs, goals and priorities."

He also urged the association to:

—"Make everyone aware that we are for national health insurance as needed," and have our own NHI bill, Medicredit, in Congress.

—Organize the development of guidelines to protect the privacy of patient information accumulated in computerized health care centers. No inherent right of the patient "is greater—or presently more imperiled—than what he tells his doctor."

—Assume a "new and strong coordinating role" in medical education, partly so that it will give more attention to human concern for patients. "If the AMA is to be held accountable for what our profession does, then it must insist upon more responsibility for the manner in which our profession is trained."

—Establish a "university without walls," to confer an advanced academic degree, stimulating more physicians to enroll in continuing education.

—Develop nationwide proposals for arbitration and no-fault procedures in malpractice cases, to curb the serious impact of these cases on health care costs.

Physicians and the Government

PSRO. Speculation over possible changes in PSRO policy by the House dominated the attention of those attending the convention, including the media.

During its day-long hearing on Monday, June 24, Reference Committee A considered two reports and 25 resolutions bearing on the issue, and estimated that 64 speakers addressed themselves to PSRO.

But on Wednesday, the Delegates—cognizant of the hours of debate devoted to PSRO at Anaheim last December and in New York City last June—overwhelmingly voted (202 to 24) to terminate debate after a few minutes.

Then the House adopted a substitute resolution on

PSRO proposed by the reference committee, whose members emphasized that the resolution provides the association with a "clear-cut, definitive position which cannot be misunderstood by anyone inside or outside this House of Delegates." The resolution:

—Instructs the Board of Trustees to seek constructive amendments to the PSRO program, particularly in potentially dangerous areas such as confidentiality, malpractice, development of norms, quality of care, and the authority of the Secretary of HEW.

—Directs the AMA to continue efforts to achieve legislation which allows the profession to perform peer review according to established medical philosophy and the best interests of the patient.

—Emphasizes that state associations which elect non-compliance with PSRO are not prevented from doing so by the new policy, but urges such associations to develop effective non-PSRO review programs embodying the principles endorsed by the profession as constructive PSRO alternatives.

The new policy also provides that in the event that the PSRO program does, in fact, adversely affect patient care or conflict with AMA policy, then "the Board of Trustees (will) be instructed to use all legal and legislative means to rectify these shortcomings."

Extension of Policy on National Health Insurance. Two statements on national health insurance were adopted after lengthy debate. One calls on the Board of Trustees to cooperate with state associations "to attempt to devise mechanisms mutually acceptable to the private medical and insurance communities which will ensure the provision of health insurance coverage through the purchase of private health insurance, and to seek means to secure favorable Congressional and public support for their adoption."

During discussion, it was pointed out that the addition to the NHI policy does not affect AMA support for Medicredit, but is intended to stimulate new health insurance mechanisms. The second resolution calls on the AMA and component associations to work to detach "any national health insurance program from the controlling intrusions of existing PSRO laws and regulations."

Oppose "Public Utility" Medicine. The House went on record as being opposed to certain bills in Congress which would replace the federal "Health Professions Educational Assistance Act" which expired June 30. Under the bills, comprehensive health planning programs would be replaced with public utility type bodies which would control certain aspects of health education and health care delivery, and medical licensure. An amended resolution adopted by the House directs the

Board of Trustees to mobilize AMA membership in opposition to offensive sections of the proposed legislation, and take strong actions on other fronts.

In other actions affecting physicians and the government, and other third parties, the House:

—Directs the AMA to seek an extension of from 30 to 90 days to respond to proposed health regulations printed in the *Federal Register*, and that government agencies using the *Federal Register* for rule-promulgating purposes be urged to hold public hearings on the merits of proposed legislation.

—Calls on the AMA to oppose the concept of claims rejection on the basis of "diagnostic admission" or "lack of medical necessity" without prior physician notification, and to recommend a peer review mechanism be established independent of the third-party carrier to review claim conflicts with such mechanisms to be established by existing medical foundations, medical societies, or other independent peer review organizations.

—Requests the AMA to work with third parties to secure increased acceptance of the AMA uniform health insurance claim form, and urges state associations to encourage acceptance of the form by insurance commissioners, and, if necessary, through state legislation.

—Urges continued AMA efforts to prevent future imposition of government fee controls, and opposes the mandatory imposition of a "Healthcard" as the payment mechanism under the Administration's national health insurance plan, and instead, reaffirmed the right of the physician to bill patients directly.

Physicians and the Public

Confidentiality of Patient Records. The House adopted two reports bearing on confidentiality of medical records. Report I of the Council on Medical Service describes a wide-ranging series of proposals to enable the medical profession and insurance companies to "maintain the confidentiality and security of patient information." Report S of the Board of Trustees notes that the Council on Legislation is developing model legislation as a guide to possible state legislation to preserve confidentiality, and that a model bill should be ready for consideration by the House at the 1974 Clinical Session in Portland, Oregon.

In other actions affecting physicians and the public, the House directed that:

—The new national blood policy be privately implemented through the appropriate organization of the AMA, state and county medical societies, and their committees on transfusion.

—The AMA continue to inform the public and the profession of the potential problems and risks in permitting the non-physician substitution of drugs of choice prescribed by physicians, and that state associations sup-

port this position before state legislatures considering laws which would allow drug substitutions.

Physicians, Hospitals, and Medical Schools

Report on Physician-Hospital Relations, 1974. The House adopted the 104-page "Report on Physician-Hospital Relations, 1974," compiled by the Council on Medical Service and its Committee on Private Practice. An update of an earlier report made in 1964, the 1974 version contains 14 specific recommendations to cope with problems developing between some hospitals and their medical staffs. Among other things, the recommendations are aimed at protecting medical staffs against unilateral action by hospital governing boards relative to staff bylaws, rules, and regulations.

Students, Interns and Residents. Two informational reports dealing with possible guidelines for housestaffs in developing contracts in institutions in which they serve generated considerable discussion before Reference Committee C. Among those testifying were medical students, residents, faculty members, hospital directors, and members of the AMA Board of Trustees and Council on Medical Service. Because of the importance and the complexity of the issues involved, the two reports, plus a revised report submitted by the Intern and Resident Business Session during the convention, were referred to the Board of Trustees for further study and consultation with appropriate groups. Delegates directed the Board to report back at the 1974 Clinical Session.

The House adopted a resolution calling for the AMA, through appropriate committees and councils, to assure due process for medical students, and requested a further report at the next Clinical Session.

Another resolution proposing guidelines for "Fair, Professional Relationships between Training Institutions and House Officers" (intended for inclusion in the essentials of approved internships, and residencies) was referred for further study and report back at the Clinical Session.

The House adopted a resolution calling on the AMA to encourage—and urging medical schools to implement—a series of lecture programs for students on the socio-economic aspects of medicine.

New Liaison Committee on Medical Education. Delegates adopted Board of Trustees Report I calling for the establishment of a new Liaison Committee on Continuing Medical Education. Structure and duties of the new committee have been worked out by AMA representatives and those representing the American Board of Medical Specialties, the American Hospital Association, the Association of Medical Specialties, and the Council of Medical Specialty Societies.

In other actions, the House:

—Supported a moratorium on the licensure of allied health occupations until the end of 1975.

—Adopted a report containing "Essentials of an Accredited Educational Program for the Surgeon's Assistant."

—And reaffirmed AMA opposition to blanket pre-admission certification of hospital patients by governmental or hospital edict.

—Adopted a resolution urging the AMA to support the development of preceptor programs in primary patient care to stimulate the production of more primary care physicians.

Association and Internal Matters of the House

Specialty Representation in the House. In response to proposals to increase specialty representation in the House, the Reference Committee on Constitution and Bylaws reported extensive testimony, and urged "all concerned parties to increase communication, cooperation and liaison" to resolve the complex question.

The House adopted the reference committee report, and referred report H of the Board of Trustees containing proposed modifications for specialty representation in the House to the Council on Constitution and Bylaws for inclusion in its continuing study.

Malpractice Problems. A resolution calling on the AMA and constituent societies to "institute a nationwide public education program to inform the public" of malpractice problems, and for the AMA to "spearhead state and federal legislation" to correct malpractice inequities, was referred to the Board of Trustees and its Committee on Insurance for report back at the 1974 Clinical Session.

Membership Opinion Polls. The House concurred in recommendations to reconstitute the Committee on Membership Opinion Polls as a Special Committee of the House, and authorized future polls of membership opinion subject to approval of the Board of Trustees.

In other internal matters, the House:

—Requested changes in the constitution and bylaws to permit additional scientific sessions on a regional basis (to supplement the programs at the annual and clinical sessions) so the House can take affirmative action on the proposal at the 1974 Clinical Session.

—Instructed the Board of Trustees to distribute to each delegate, alternate delegate, and constituent state association a summary of actions taken at each meeting of the Board.

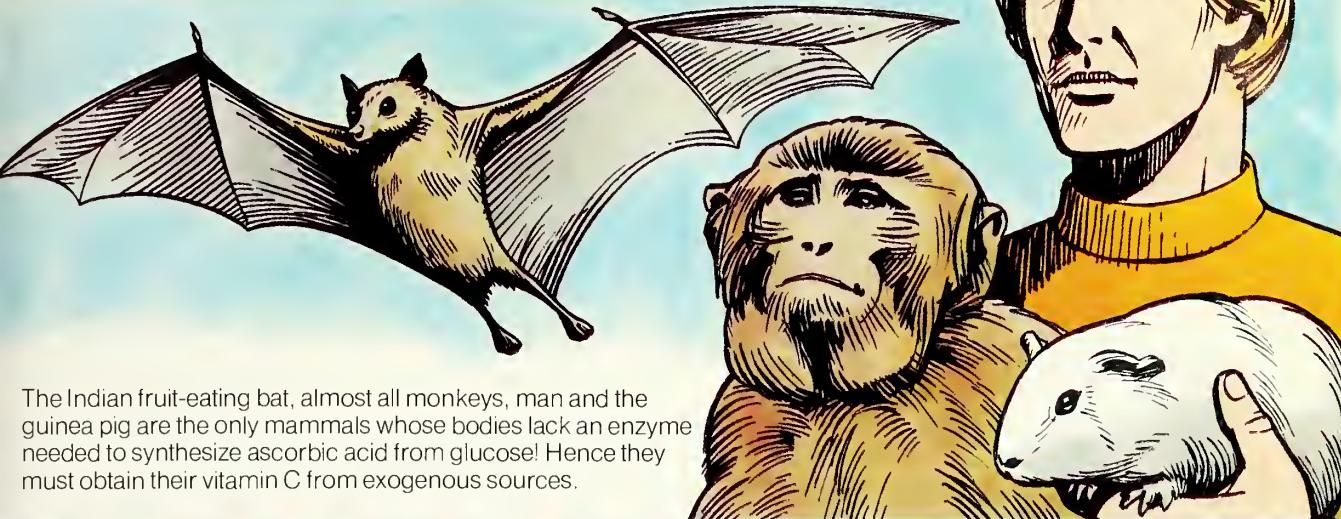
Miscellaneous Actions of the House

In miscellaneous actions, the House:

—Changed the name of the Section on Plastic and

(Continued on page 288)

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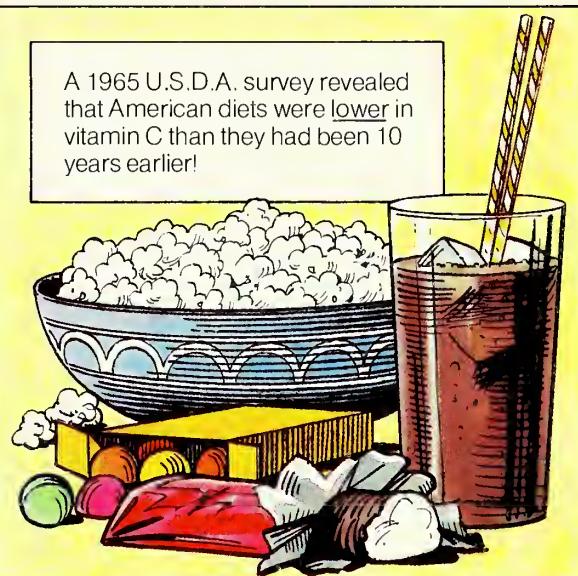


The Indian fruit-eating bat, almost all monkeys, man and the guinea pig are the only mammals whose bodies lack an enzyme needed to synthesize ascorbic acid from glucose! Hence they must obtain their vitamin C from exogenous sources.



De Joinville writing about a 13th century crusade reported that barber surgeons had to "cut away the dead flesh from the gums to enable people to masticate their food." The disease he described was probably scurvy.

A 1965 U.S.D.A. survey revealed that American diets were lower in vitamin C than they had been 10 years earlier!

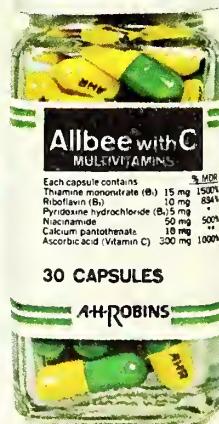


The outer leaves of cabbage and brussels sprouts contain more vitamin C than the heads. Yet, ironically, these are often trimmed away by the grocer to improve appearance and enhance sales appeal! Many housewives trim them even more before cooking!

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Brief summary. Adverse Reactions: Blurring of vision, dry mouth, difficult urination, and flushing or dryness of the skin may occur on higher dosage levels, rarely on usual dosage. Contraindications: Glaucoma; renal or hepatic disease; obstructive uropathy (for example, bladder neck obstruction due to prostatic hypertrophy); or hypersensitivity to any of the ingredients.

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Each gram contains: Aerosporsin® brand Polymyxin B Sulfate 5,000 units; zinc bacitracin 400 units;
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INDICATIONS: Therapeutically, used as an adjunct to appropriate systemic therapy for topical infections, primary or secondary, due to susceptible organisms, as in: • infected burns, skin grafts, surgical incisions, otitis externa • primary pyoderma (impetigo, ecthyma, syphilis vulgaris, paronychia) • secondarily infected dermatoses (eczema, herpes, and seborrheic dermatitis) • traumatic lesions, inflamed or suppurating as a result of bacterial infection.

Prophylactically, the ointment may be used to prevent bacterial contamination in burns, skin grafts, incisions, and other clean lesions. For abrasions, minor cuts and wounds accidentally incurred, its use may prevent the development of infection and permit wound healing.

CONTRAINDICATIONS: Not for use in the eyes or external ear canal if the eardrum is perforated. This product is contraindicated in those individuals who have shown hypersensitivity to any of the components.

WARNING: Because of the potential hazard of nephrotoxicity and ototoxicity due to neomycin, care should be exercised when using this product in treating extensive burns, trophic ulceration and other extensive conditions where

absorption of neomycin is possible. In burns where more than 20 percent of the body surface is affected, especially if the patient has impaired renal function or is receiving other aminoglycoside antibiotics concurrently, not more than one application a day is recommended.

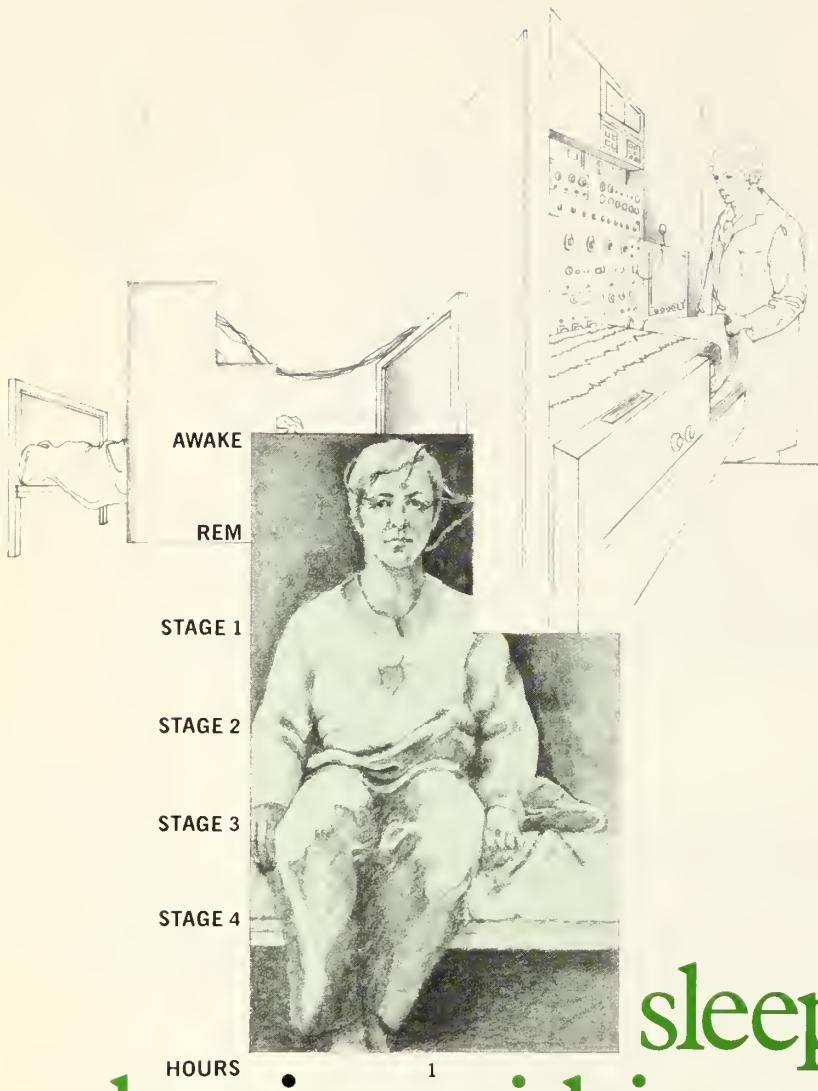
PRECAUTIONS: As with other antibacterial preparations, prolonged use may result in overgrowth of nonsusceptible organisms, including fungi. Appropriate measures should be taken if this occurs.

ADVERSE REACTIONS: Neomycin is a not uncommon cutaneous sensitizer. Articles in the current literature indicate an increase in the prevalence of persons allergic to neomycin. Ototoxicity and nephrotoxicity have been reported (see Warning section).

Complete literature available on request from Professional Services Dept. PML.



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Three insomnia patients selected for difficulty falling asleep were administered Dalmane (flurazepam HCl) 30 mg for 14 consecutive nights. Placebo was given for four nights prior to and four nights after Dalmane. Physiologic tracings on Dalmane nights 1-3 showed sleep induction time averaged 13.90 minutes; on Dalmane nights 12-14, 18.80 minutes. Combined average for the 6 monitored drug nights was 16.35 minutes.¹

Average Time Required
to Fall Asleep (4 Studies,
16 Subjects²⁻⁵)



confirmed by clinical studies in four geographically separated sleep research laboratories²⁻⁵

Using a 14-night protocol involving eight insomniac and eight normal subjects, four studies confirmed the sleep-inducing effectiveness of Dalmane (flurazepam HCl) and the reproducibility of this response. On average, one 30-mg capsule induced sleep within 17 minutes. In all these studies, Dalmane induced sleep rapidly, reduced nighttime awakenings, and provided 7 to 8 hours of sleep without repeating dosage.²⁻⁵

Dalmane (flurazepam HCl) induces and maintains sleep, with relative safety

Dalmane is generally well tolerated; morning "hang-over" has been relatively infrequent. While dizziness, drowsiness, lightheadedness and the like have been noted most often, particularly in the elderly and debilitated, physicians should be aware of the possibility of more serious reactions, as noted below.

Before prescribing Dalmane (flurazepam HCl), please consult Complete Product Information, a summary of which follows:

Indications: Effective in all types of insomnia characterized by difficulty in falling asleep, frequent nocturnal awakenings and/or early morning awakening; in patients with recurring insomnia or poor sleeping habits; and in acute or chronic medical situations requiring restful sleep. Since insomnia is often transient and intermittent, prolonged administration is generally not necessary or recommended.

Contraindications: Known hypersensitivity to flurazepam HCl.

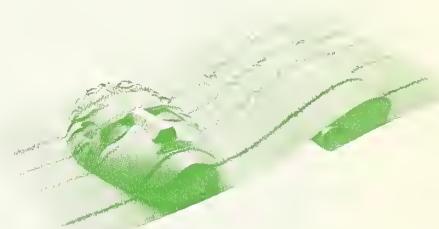
Warnings: Caution patients about possible combined effects with alcohol and other CNS depressants. Caution against hazardous occupations requiring complete mental alertness (e.g., operating machinery, driving). Use in women who are or may become pregnant only when potential benefits have been weighed against possible hazards. Not recommended for use in persons under 15 years of age. Though physical and psychological dependence have not been reported on recommended doses, use caution in administering to addiction-prone individuals or those who might increase dosage.

Precautions: In elderly and debilitated, initial dosage should be limited to 15 mg to preclude oversedation, dizziness and/or ataxia. If combined with other drugs having hypnotic or CNS-depressant effects, consider potential additive effects. Employ usual precautions in patients who are severely depressed, or with latent depression or suicidal tendencies. Periodic blood counts and liver and kidney function tests are advised during repeated therapy. Observe usual precautions in presence of impaired renal or hepatic function.

Adverse Reactions: Dizziness, drowsiness, lightheadedness, staggering, ataxia and falling have occurred, particularly in elderly or debilitated patients. Severe sedation, lethargy, disorientation and coma, probably indicative of drug intolerance or overdosage, have been reported. Also reported were headache, heartburn, upset stomach, nausea, vomiting, diarrhea, constipation, GI pain, nervousness, talkativeness, apprehension, irritability, weakness, palpitations, chest pains, body and joint pains and GU complaints. There have also been rare occurrences of sweating, flushes, difficulty in focusing, blurred vision, burning eyes, faintness, hypotension, shortness of breath, pruritus, skin rash, dry mouth, bitter taste, excessive salivation, anorexia, euphoria, depression, slurred speech, confusion, restlessness, hallucinations, and elevated SGOT, SGPT, total and direct bilirubins and alkaline phosphatase. Paradoxical reactions, e.g., excitement, stimulation and hyperactivity, have also been reported in rare instances.

Dosage: Individualize for maximum beneficial effect. *Adults:* 30 mg usual dosage; 15 mg may suffice in some patients. *Elderly or debilitated patients:* 15 mg initially until response is determined.

Supplied: Capsules containing 15 mg or 30 mg flurazepam HCl.



when restful sleep
is indicated

Dalmane® (flurazepam HCl)

One 30-mg capsule h.s. — usual adult dosage
(15 mg may suffice in some patients).

One 15-mg capsule h.s. — initial dosage for
elderly or debilitated patients.

- induces sleep within 17 minutes, on average
- reduces nighttime awakenings
- sustains sleep 7 to 8 hours, on average, without repeating dosage



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REFERENCES: 1. Kales A, et al: Arch Gen Psychiatry 23:226-232, Sep 1970

2. Karacan I, Williams RL, Smith JR: The sleep laboratory in the investigation of sleep and sleep disturbances. Scientific exhibit at the 124th annual meeting of the American Psychiatric Association, Washington DC, May 3-7, 1971

3. Frost JD Jr: Data on file, Medical Department, Hoffmann-La Roche Inc, Nutley NJ

4. Vogel GW: Data on file, Medical Department, Hoffmann-La Roche Inc, Nutley NJ

5. Dement WC: Data on file, Medical Department, Hoffmann-La Roche Inc, Nutley NJ

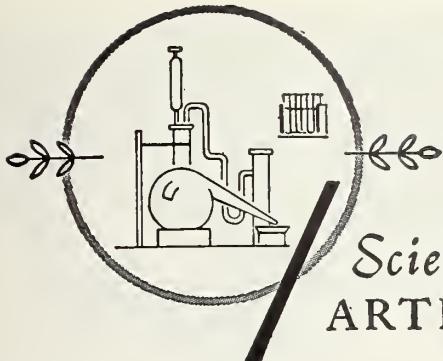


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Scientific ARTICLES

Those Flexor Tendons

Staged Tendon Grafts Utilizing Silastic Rods

JOHN E. WINTER II, M.D., GERALD D. NELSON, M.D.

and TOMMY E. KENDALL, M.D., Wichita

LOCAL HAND ANATOMY and the mechanism of tendon healing play pivotal roles in the final results of flexor tendon repair in "no-man's land" (that area from the distal palmar crease to the flexion crease of the proximal interphalangeal joint). First, both the flexor digitorum sublimis and the profundus tendons are contained in a common tendon sheath. This intimate association necessitates special techniques in treating lacerations of these tendons. Secondly, and of equal importance, is the manner in which tendons heal. The one-wound-one-scar concept of Peacock¹ and Madden² states that a laceration of the flexor tendons in "no-man's land" will result in a scar involving both tendons. This involvement of both tendons in a single scar also occurs when only one tendon is lacerated.

The repair of lacerated flexor tendons in "no-man's land" in the hand generates a great deal of discussion among surgeons treating hand injuries. The most successful mode of treatment remains controversial, and varies according to the surgeon's preference and experience, the severity of the injury, and the needs of the patient.

Since 1900, various materials have been used in an effort to induce a new tendon sheath (pseudosheath),

and thereby lessen the formation of adhesions between tendons, tendon sheath, and surrounding tissues.³ In 1963, Carroll and Bassett⁴ reported on the use of

Complications leading to restriction of motion in digits which sustain tendon injuries in "no-man's land," as well as procedures which will decrease them, are discussed.

silastic rods for the induction of a pseudosheath. The technique has since been advocated for use in varying types of injuries.

A few experienced hand surgeons believe that the best treatment for flexor tendon lacerations in "no-man's land" is primary repair. However, judgment is required in case selection, and the ideal wound is less than six hours old with minimal injury to surrounding soft tissue, bones, or joints. There is disagreement on the question of whether or not primary repair of both flexor tendons within the tendon sheath should be performed, since this is technically a difficult procedure.^{8, 9} Most hand surgeons will in all likelihood obtain the best results with some form of tendon graft.¹⁰ Staged tendon grafts utilizing silastic rods for pseudosheath formation are generally accepted, even though there may be some disagreement on the specific indications for the use of silastic rods.

From the Section of Plastic Surgery, Department of Surgery, St. Francis Hospital, Wichita, Kansas 67214.

Presented at the annual meeting of the Kansas Chapter, American College of Surgeons, November 10, 1973, Topeka.

Address reprint orders to Gerald D. Nelson, M.D., 925 North Emporia, Wichita, Kansas 67214.

Patients selected for staged tendon grafts had lacerations of both flexor tendons only or of the profundus tendon in "no-man's land." For the procedure to be performed when only the profundus was lacerated, the patient had to state that motion at the distal interphalangeal joint was essential. Other indications were: (1) flexor tendon lacerations in "no-man's land" that were seen more than six weeks post injury; (2) non-advantageable distal profundus lacerations; and (3) severe injuries involving soft tissue, bones, and joints in which a primary repair or delayed tendon graft appeared doomed to failure.

Method

In the first stage of the operation, a zig-zag incision is made in the digit and distal palm, and the profundus tendon is transected near its insertion leaving 5 to 7 mm of tendon stump. A second transverse incision is made on the volar aspect of the distal forearm, and the tendon is transected 1 to 2 cm distal to the musculotendinous junction. The tendon is removed, and the proximal stump is sutured to a neighboring tendon. This prevents shortening, and facilitates location and identification during the second stage. The sublimis tendon is retained when not injured. The tendon sheath is excised in the finger, as is the muscle belly of the lumbrical in the palm. It may also be necessary to remove excessive scar tissue. The pulleys are retained; a silastic rod is placed beneath the pulleys and attached to the distal profundus stump. The rod extends into the forearm, and is not attached to the proximal tendon stump (*Figure 1*). The wound is closed, and a pressure dressing is applied.

Eight weeks should pass before the second stage is performed. Passive motion must be worked on diligently by the patient during this period, and if the passive motion obtained is deemed inadequate, physical therapy is continued until nearly normal passive motion is obtained. The second stage procedure is then performed. Palmaris longus or plantaris tendons are preferred for grafts; but if they are absent, a toe extensor may be used. Incisions are made in the healed scars of the distal finger and the wrist from the first stage. The graft is attached to the proximal tendon stump, the distal end sutured to the silastic rod, and pulled through the pseudosheath. A drill hole is started through the distal phalanx from the palmar aspect, and drilled through the nail dorsally. The graft is drawn through the hole and a metal clip placed through the tendon, thus securing it dorsal to the nail.¹¹ The exposed distal portion of the tendon graft on the dorsal surface of the finger-nail spontaneously sloughs during the third postoperative week. Proper tension on the graft is critical. To de-



Figure 1. Silastic rod in place beneath pulleys after excision of tendon and sheath.

termine this, the hand is placed in a relaxed position with the wrist slightly extended. In this position, the finger being operated on should be flexed slightly more than its neighbors. This tension is easily adjusted by moving the metal clip on the distal end of the tendon graft. A dorsal splint is applied from mid-forearm to fingertips.

The splint is removed three weeks postoperatively. Gentle passive flexion and extension exercises are initiated, and a gradual transition to active flexion and extension is accomplished over the first three weeks after the splint is removed. Vigorous active flexion is begun approximately six weeks postsurgery.

Results

Results were evaluated by two methods. First, the degrees of motion at the metacarpophalangeal joint (MP), proximal interphalangeal (PIP), and distal interphalangeal (DIP) joint were measured as shown in *Figure 2*. Secondly, the functional result was judged by the relationship of the distal finger pulp to distal palmar crease (DPC) (*Figure 3*).

Staged tendon grafts were performed in seven patients with only the profundus tendon injured, and in

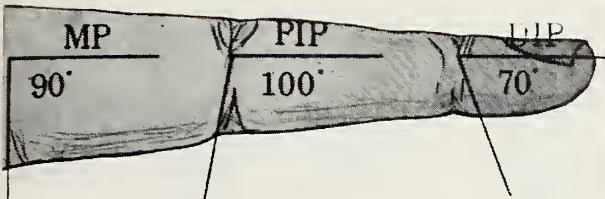


Figure 2. Black lines represent normal range of motion for MP, PIP, and DIP joints of the finger.

eight digits of five patients with both the sublimus and profundus tendons injured. The average age of patients with the profundus injury was 20 years; with both tendons injured the average age was 31 years. The length of followup ranged from 7 to 34 months, with an average of 16.5 months.

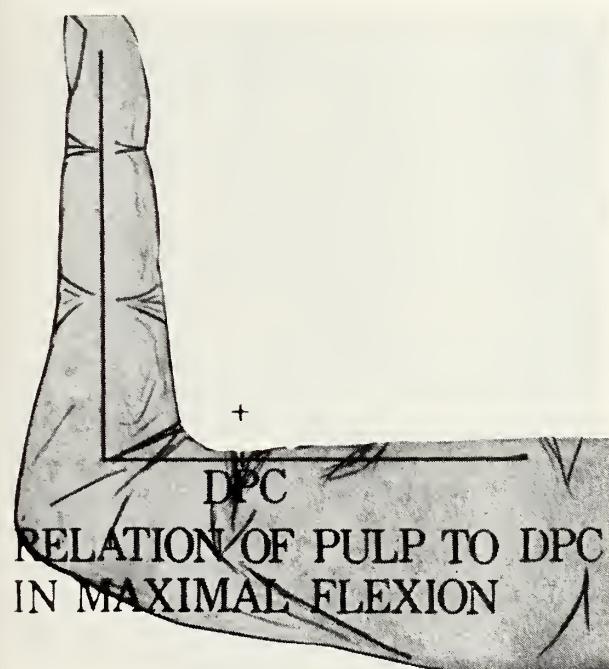


Figure 3. + shows relationship of finger pulp to DPC with maximum flexion.

The active motion regained in digits with both tendons injured was 28° at the DIP joint, 42° at the PIP joint, and 68° at the MP joint (Figure 4). This group includes one complete failure in a patient who sustained a severe bomb-blast injury to two digits. The seven digits with the profundus injury regained 44° motion at the DIP, 86° at the PIP, and 90° at the MP joints (Figure 5).

A scattergram of the distance from the distal finger pulp to DPC reveals the functional return obtained by grafting (Figure 6). Patients with injury to the profundus tendon only, had better flexion of the finger pulp to DPC than the patients with both the profundus and sublimus tendons injured.

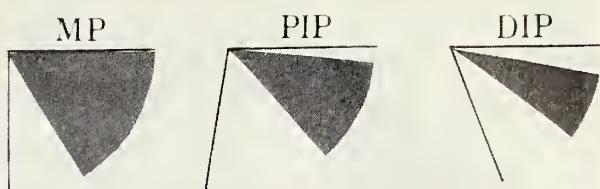


Figure 4. Black lines represent normal range of motion of MP, PIP, and DIP joints. Average post-graft range of motion with injury of both profundus and sublimus tendons is shown by shaded area.

This comparison of motion regained after grafting when both flexor sublimus and profundus tendons were injured, versus the profundus tendon injuries, indicates the desirability of retaining an intact sublimus tendon. Those digits with the sublimus tendon intact had 16°, 43°, and 22° more motion at the DIP, PIP, and MP joints respectively. From this small series it appears that routine sacrifice of the sublimus tendon in lacerations in "no-man's land" as advocated by Boyes¹² decreases the postgraft range of motion. Obviously the type, site, and severity of the injury determine the advisability of retaining the sublimus tendon.

The patient's age has an important bearing on the final result. The younger the patient, the greater the return of motion.¹³ Patients in this series with the best results had only the profundus injured, and averaged 18 years of age.

Discussion

Obtaining good results in tendon repair work in these difficult cases is dependent upon many factors; only a few of these factors can be controlled by the surgeon. Problems that may be encountered are listed in Table I.

Variations in wound healing, anatomy, severity and site of injury, pre-injury joint motion, general hand physique, surgical technique, and patient's age and motivation all contribute to the final outcome in tendon repair.

Bone and joint deformity, adhesions, scar contractures,

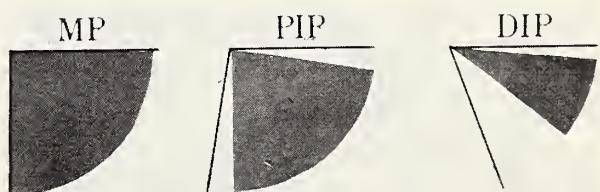


Figure 5. Black lines represent normal range of motion of MP, PIP, and DIP joints. Average post-graft range of motion when profundus tendon only injured is shown by shaded area.

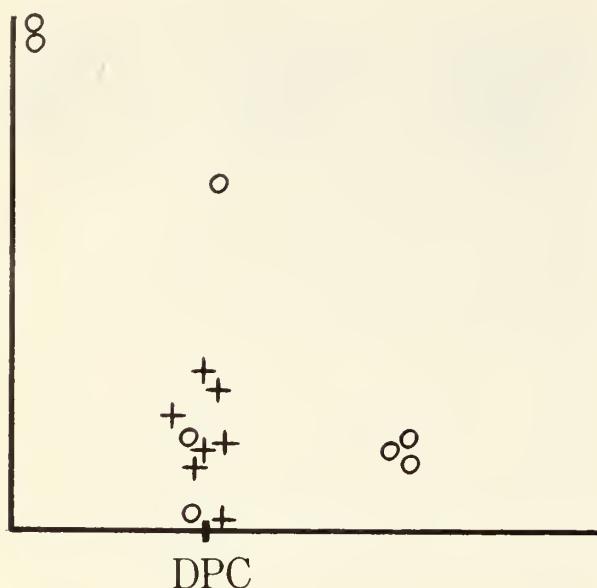


Figure 6. + represents profundus tendon only injured; O represents both profundus and sublimis tendons injured.

synovitis, and poor patient motivation may collectively or individually decrease passive motion. Maximum correction of all factors under the surgeon's control in order to achieve maximum passive motion must be obtained before a tendon graft is inserted.

Adhesions between the tendon graft and immobile surrounding structures decrease active motion. Some hand surgeons believe these soften with time, but most will probably require tenolysis. Adhesions should be allowed to mature at least three months before considering tenolysis.¹⁰ Adhesions to the palmar fascia, transverse carpal ligament, or antebrachial fascia are relatively immobile; therefore, the proximal attachment must be placed as far away from these structures as possible.^{13, 14} If this proves to be impractical, they must be excised in the area of the graft attachment.

Bowstringing of the graft and sheath may occur when pulleys are absent. This may result from a deficient attachment of the new sheath to the fibro-osseous tunnel

TABLE I
COMPLICATIONS

1. Failure to mobilize digit
2. Adhesions
3. Bowstringing
4. Failure of active motion to equal passive motion
5. Swan-neck (recurvatum) deformities of the PIP joint
6. Disruption of the proximal or distal graft attachments
7. Loss of extension
8. Neurologic deficits

or the periosteum in the digit. Wearing a ring on the finger may correct this problem. Problem cases require the construction of a new pulley using a fascia lata graft.

Failure of active motion to equal the full range of passive motion is common. Factors which can cause this discrepancy are errors in graft length or tension (with a possible "lumbrical plus" deformity),^{14, 15} muscle dysfunction, adhesions, bowstringing, and inadequate exercise. The handedness of the patient and amount of motion required in his vocation or avocations bear directly on the flexion regained. Dynamic splinting is utilized to aid inadequate active motion in the rehabilitation program. The formation of adhesions is due to ingrowth of vascular tissue to nourish the graft. In some cases this may be overabundant. Satisfactory motion may occur at an individual joint, but less than full motion is present when the attempt is made to touch the finger pulp to the DPC. In these cases, sufficient gliding function is present for motion in one joint, but the tendon excursion is insufficient for simultaneous maximum flexion of all joints.

Patients with hypermobile joints may develop a recurvatum, or "swan-neck" deformity, of the PIP joint secondary to redundancy of the volar plate when the sublimis is absent. Recognizing this problem during the first stage may allow correction by: (1) plication of the volar plate and digital fascia; (2) separate suture of the fascial retinacular system;¹² (3) spanning the joint with a long segment of lacerated sublimis tendon that is intact distally (this can be done only when the injury is proximal to the mid-portion of the middle phalanx); (4) performing a tenodesis with a free slip of lacerated sublimis; or (5) splinting in mild flexion. Recognition after the second stage may require spanning the joint with a fascia lata graft, or performing one of the above procedures.

Disruption of the attachment of the silastic rod to the distal tendon stump may occur. In one patient, the rod was found curled in the palm, but it had been in place long enough for pseudosheath formation. This problem is avoided by not attaching the silastic rod to the proximal tendon stump, and thereby eliminating tension on the distal attachment.

Both proximal and distal graft attachments may rupture after the second stage, but 50 per cent of these may be salvaged by early recognition. Avoidance of undue tension early in convalescence will decrease the frequency of this complication. The patient usually does not regain full extension of the DIP and PIP joints. Capsular contractures, scar formation, inadequate graft length, and general hand physique contribute to the degree of flexion contracture. Proper surgical technique

and postoperative care will aid in the elimination of the majority of contractures. The sum of less than 40° of extension lost in the DIP and PIP joints in the index and long fingers, and less than 60° in the ring and small fingers, while not desirable, is acceptable.¹² This degree of contracture will not handicap most individuals.

Neurologic deficits decrease the usefulness of the digit even though adequate gliding function has been restored. Digital nerve repair at the time of injury should be done if possible, since this may avoid painful neuroma formation. Delayed nerve repair in the interval between the first and second stage in a patient attempting to achieve full passive motion is not indicated, since this would delay achievement of full passive motion.

Summary

The technique of pseudosheath formation by silastic rods for staged tendon grafts is a useful procedure to reestablish motion in digits which sustain tendon injuries in "no-man's land." The complications leading to restriction of motion as well as procedures which will decrease them both in number and severity have been discussed. It is desirable to retain an intact sublimus tendon. As Mayer and Ransohoff¹⁷ pointed out in 1936, however, the creation of a new tendon sheath does not substitute for an exacting, atraumatic surgical technique.

Acknowledgment

H. O. Marsh, M.D., offered many helpful suggestions in the preparation of this paper.

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The 52nd Annual Fall Clinical Conference of the Kansas City Southwest Clinical Society will be held at Crown Center Hotel in Kansas City, Missouri, on October 31, November 1 and 2, 1974. This postgraduate medical education program will be presented in cooperation with the School of Medicine and the Division for Continuing Education of the University of Missouri-Kansas City.

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Total Knee Replacement

A Surgical Method of Treating the Arthritic Knee

HARRY G. KROLL, M.D., Topeka

TOTAL JOINT REPLACEMENT concept has proved so successful in the treatment of hip disease, that the same principles of total joint arthroplasty have now been applied with equal facility in the treatment of arthritis in the knee joint.

Just as the development of hip arthroplasties evolved from the proximal femoral cup mold and hemiprosthesis, so the precursor of total knee implants was the early distal femoral and tibial plateau arthroplasty. Historically, the patient with rheumatoid arthritis who had painful, swollen joints and progressing deformity was a challenge to physicians to relieve pain and restore function to the knee. The first successful knee arthroplasty was reported in the English medical literature by Ferguson,¹ in 1861, when he resected the knee joint. From 1914 through 1953, numerous efforts at arthroplasty of the severe arthritic knee joint were attempted, including the reshaping of bone and the interposition of tissue or foreign substances.

Murphy² once (in 1913) used fascia lata and fat for a joint surface; Putti³ also used fascia later in 1921, as did Albee⁴ in 1928; Campbell⁵ tried prepatellar bursal tissue in 1921; but Baer⁶ first tried non-metallic foreign material in 1918, with chromatized pig bladder. Whereas Sampson⁷ used cellophane as an interface layer in 1949, Brown, McGraw and Shaw⁸ tried skin in 1958; Kuhns and Potter⁹ utilized sheets of nylon by 1950. Unfortunately, none of these efforts succeeded until Smith-Petersen introduced the metallic cup arthroplasty of the hip in 1942. However, it was not until 1953 that a distal femoral mold arthroplasty was tried at the Massachusetts General Hospital, and the results of its use in 78 patients were reported by Jones, Aufranc, and Kermond in 1967.¹⁰

McKeever designed a metal tibial plateau implant in the late 1950s,¹¹ which was followed by the more widely accepted tibial prosthesis of McIntosh in 1966.¹² The McIntosh implant was originally molded of acrylic similar to that of Kjaer and Jansen of Denmark. In 1969,

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Address reprint orders to: Harry G. Kroll, M.D., 1001 Horne, Topeka, Kansas 66604.

Platt and Pepler had reported the results of arthroplasties on 62 knees treated with femoral mold prosthesis in a ten-year followup period.¹³

In 1947, an experimental acrylic, hinged total knee replacement was designed by Judet,¹⁴ and Magnoni first reported his successful use of a total knee implant in 1949.¹⁵ By 1951, Waldius, of Sweden, had inserted his first total knee prosthesis, but redesigned the unit entirely of metal by 1958.¹⁶ The design of other hinged total knee devices followed in quick succession: Sedden in 1952, Jackson Burrows in 1954, Shires in 1954,¹⁷ McAusland in 1957,¹⁸ Young in 1963,¹⁹ Letournel and LaGrange²⁰ also introduced their hinged total knee of the Waldius type in 1973.

Once the hazards of joint sepsis and the loosening of the devices was overcome, total knee arthroplasty was destined to become an established procedure.

Current total knee implants number over 20 variations but are basically of three types, including the several modifications now widely accepted: Waldius or hinged joint; geometric; and the polycentric or modular knee. The design of these implants embodies certain mechanical features requisite to adequate arthroplasty as follows: the possession of rotatory and lateral stability; the preservation of collateral and cruciate ligaments; the minimal removal of bone for the fitting of a prosthesis which is readily inserted; provision of a range of motion approaching 90°; and utilization of materials for the implants which are physiologically acceptable to the body with a minimal degree of wear. With these criteria in mind, the concept of a geometric knee was introduced by Coventry, Finerman, Riley, Turner and Upshaw.²¹

The geometric knee implant provides a metal-to-plastic articulating surface, with the metal alloy replacing the joint surface of the femoral condyles, while polyethylene replaces the tibial plateau. These two condylar surfaces of the implant are joined by an intercondylar bar. The element replacing the two tibial plateaus consists of a single high-density polyethylene track of U-shaped design, allowing for the presence of the cruciate ligaments. The matching articular surfaces have a functional and anatomical design to provide a full range of motion and joint stability. The implants in turn are embedded

in a cement of methyl methacrylate for fixation to the cancellous bony structure. Under these circumstances the integrity of the knee joint has been reestablished.

An alternative form of total knee implant is the polycentric prosthesis, which is similarly utilized for the arthritic knee. Peterson and Bryan²² adapted and modified the Gunston²³ implant of 1969, which is basically two elements: a femoral component of two half-circle discs designated as runners and inserted into the respective femoral condyles, and two high density polyethylene tracks placed in parallel slots in the tibial plateaus. The matching metal and plastic elements are embedded in methyl methacrylate cement for fixation to the bony surfaces of the femur and tibia for the restoration of joint function. It is obvious that the implants similarly necessitate retention of ligamentous structures for joint stability, as do the geometric implants.

Should the patient have an arthritic joint which exhibits rather advanced destructive changes of the joint with loss of ligamentous stability, then the alternative fitting of a hinged-type stem prosthesis, or even an arthrodesis, of the knee may be indicated.

With the mechanics of total knee arthroplasty now considered, the clinical evaluation for proper selection of a patient needs to be emphasized. Although the technique of total joint arthroplasty was originally designed for the rheumatoid arthritic patient, those with patients who have benefited from a total knee arthroplasty. The patient who is 50 years in age or older, who has a painfully disabling knee, with or without some limited motion but with some ligamentous stability, and no evidence of previous joint infections should be considered for total knee arthroplasty.

The patient is usually hospitalized several days prior to surgery for complete medical evaluation, and also to enable the physiotherapist to acquaint him with a range of motion-exercise routines, including isometrics, to be used postoperatively. Routine x-rays of the knee should be available, plus anterior-posterior views of both knees in the standing posture, to provide an accurate determination of the degree of valgus or varus that may require correction at the time of surgery. Although a valgus or varus deformity of 15 to 23° may be corrected at the time of arthroplasty, any deformity of greater severity can be corrected more readily with a high tibial osteotomy as a separate procedure prior to an arthroplasty. Once the osteotomy has healed, then the prescribed total knee arthroplasty can be accomplished several months later.

On the day of surgery these patients receive intra-

venous antibiotics, followed by oral antibiotics one week postoperatively; a dose of 500 cc Dextran-40 in glucose daily is repeated for three successive postoperative days. The latter medication is considered a prophylactic thrombo-embolic phenomenon, although the incidence of embolic problems in total knees appears to be less than in total hips.

The operated extremity receives an application of Betadine skin preparation for three days prior to surgery and again in the operating room at the time of surgery. The leg is exsanguinated with an Esmarch bandage and ischemia is maintained with a pneumatic tourniquet. The skin incision is a long gradually medial parapatellar incision to prevent skin or marginal necrosis, and is carried down through the fascia, quadriceps mechanism, capsule, and synovia to the joint. The patella is reflected laterally and dislocated, providing excellent exposure for the entire knee joint with the knee acutely flexed at 60°. After removal of redundant synovia from about the joint, a femoral guide is inserted for the initial osteotomy followed by insertion of a template, depending upon which variety of total knee implant is utilized, *i.e.*, geometric or polycentric. Once the femoral osteotomies are completed and the femoral components fitted, attention is directed to the fitting of tibial implants, where osteotomies are again completed and tracks or runners are inserted for proper fit. Once all of the implants fit properly, they are reinserted and embedded in a mix of methyl methacrylate for fixation to the bony structures. Upon completion of the arthroplasty and removal of any excess cement from the joint, suction drainage tube is inserted and wound closure completed meticulously in layers. A Robert Jones compression dressing, comprising a large roll of fluff cotton, extends from the ankle to the groin, and incorporation of a posterior plaster splint suffices for postoperative immobilization of the knee for five days.

The extremity is suspended in a Thomas splint or Hodgson-style splint, isometric exercises begun, and patient is mobilized in a wheelchair daily. After the fifth day the compression dressings are removed, knee motion begun with supervision from physiotherapy, and a Pierson attachment, as a knee exerciser, is added to the splint. It is at this stage of convalescence that the patient is encouraged to achieve a 90° range of knee motion with a vigorous active and passive exercise program.

If there is considerable stiffness or lack of adequate joint motion during the first 10 to 14 days following surgery, knee manipulation under anesthesia may be advisable. Within six to eight weeks following surgery, the patient becomes fully ambulatory with the use of

a cane or walker, and has achieved approximately a 90° range of knee motion.

Long-term results of total knee arthroplasty are not yet available due to the relatively brief period in which this procedure has been utilized, but it is hoped that the total knee arthroplasty continues to provide a painless and functioning knee joint over a period of many years for these patients.

Summary

The concept of total knee arthroplasty has been presented, including a brief review of its historical development. The patient with a painful and poorly functioning arthritic knee is considered a candidate for total knee arthroplasty, and the operative procedure is described. A vigorous postoperative exercise regimen is prescribed for the patient to achieve a 90° range of motion and to provide an adequately painless, functioning knee.

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Carcinoma of the Pancreas

A Program for Increasing Survival

L. J. HUMPHREY, M.D., Ph.D. and
G. V. HARTMAN, M.D., Kansas City, Kansas

STATISTICS show that the incidence of carcinoma of the pancreas is increasing at almost epidemic rates, compared to previous incidence figures.¹ Explanations for this rise may rest in part in the exciting work with carcinogens under way in the laboratory of Reddy and Svoboda.² However, until the carcinogenic agents in man's environment can be identified, attempts must be made to increase the current poor survival rate.

The purpose of this communication is to report our experience with immunotherapy in combination with radiation therapy in the treatment of incurable carcinoma of the pancreas.

Methods

Patients with incurable carcinoma of the pancreas without jaundice, ascites, or inanition have been included in this series. Most patients had presented to their physician with jaundice (a bypass procedure had relieved their jaundice). After careful evaluation, the patients were entered into the combined immunotherapy-radiation therapy program. All of the radiation therapy was delivered with megavoltage equipment. The first six patients received 4500-5000 rads to the pancreas over 4½ to 5 weeks, followed immediately by 8 weeks of immunotherapy, utilizing Vaccine I as described below, with the exchange of white blood cells (WBC) at the conclusion of vaccine injections. During the past two years, patients have received 5000 rads radiation therapy to the pancreas in a split dose program with immunotherapy as follows: 3000 rads during weeks 1, 2 and 3; Vaccine II weeks 4, 5, 6 and 7; 2000 rads during weeks 8 and 9; and Vaccine II weeks 10, 11, 12 and 13. The patients are followed for disappearance of a mass, if present, and for survival.

Vaccine I and II were prepared as described previously.³ In brief, Vaccine I is prepared by mincing cancer tissue removed at surgery or autopsy, homogeniz-

ing the material, followed by freezing and thawing three times. Vaccine II is prepared by further processing Vaccine I, which is centrifuged at 102,000 $\times g$ for 75 minutes. This supernatant is concentrated and frozen until ready for use. Both of these vaccines have been given

Experience with immunotherapy in combination with radiation therapy in the treatment of incurable carcinoma of the pancreas is reported.

intradermally and subcutaneously in either of the anterior thighs, as one-milliliter weekly injections, for a total of eight injections.

Results

No untoward effects have been observed from either program of radiation therapy, from vaccine injection, or from exchange of WBC.

Eleven patients have been treated in our second program. Six patients received Vaccine I, plus exchange of WBC after 4500-5000 rads to the pancreas. The four patients who lived at least one month after exchange of WBC survived an average of 18 months. In two of the patients, a palpable pancreatic mass disappeared after completing the combined therapy.

Seventeen patients have been treated in our second program, consisting of a split course of radiation therapy and injection of Vaccine II without exchange of WBC (*Table I*). The first patient died of a pulmonary embolus two months after treatment. Of the remaining ten patients, four are alive at 5, 9, 9 and 10 months since entering the program. From *Table I*, it can be seen that the remaining six patients died 2 to 5 months after treatment, with only one patient surviving to complete the program.

Discussion

Palliative treatment for carcinoma of the pancreas over the years has not increased survival for the patient, e.g., survival following bypass averages 6.6 months.⁴ Data obtained from the unselected programs herein described show an improvement over these figures. Fur-

From the Departments of Surgery and Radiation Oncology, Kansas University Medical Center, Kansas City, Kansas.

Supported by a grant from the John A. Hartford Foundation, Inc.

Address reprint requests to: Loren J. Humphrey, M.D., Ph.D., Professor and Chairman, Department of Surgery, KUMC, Kansas City, Kansas 66103.

TABLE I

SURVIVAL OF PATIENTS WITH CARCINOMA OF THE PANCREAS TREATED BY RADIATION THERAPY AND IMMUNOTHERAPY

Patient	Therapy	Survival in Months*
1.	CO ⁶⁰ + VI + Exchange	17†
2.	CO ⁶⁰ + VI + Exchange	13
3.	CO ⁶⁰ + VI + Exchange	29†
4.	CO ⁶⁰ + VI + Exchange	24
5.	CO ⁶⁰ + VI + Exchange	3
6.	CO ⁶⁰ + VI + Exchange	3
7.	Split course CO ⁶⁰ with VII	5
8.	Split course CO ⁶⁰ with VII	9‡
9.	Split course CO ⁶⁰ with VII	10‡
10.	Split course CO ⁶⁰ with VII	5‡
11.	Split course CO ⁶⁰ with VII	9‡
12.	Split course CO ⁶⁰ with VII	4
13.	Split course CO ⁶⁰ with VII	2
14.	Split course CO ⁶⁰ with VII	5
15.	Split course CO ⁶⁰ with VII	2
16.	Split course CO ⁶⁰ with VII	3
17.	Split course CO ⁶⁰ with VII	2

* Survival from time of biopsy proved diagnosis to death.

† Pancreatic mass disappeared after therapy.

‡ Still living.

VI = Vaccine one. VII = Vaccine two.

thermore, the recent report of Haslam and co-workers⁵ indicates increased survival by utilizing radiation therapy with 5-fluorouracil. With the advent of megavoltage radiation therapy, it became feasible to use radiation as an adjunct to help control pain and delay the development of regional tumor spread.

While the number of patients in our series is small, the greater survival in patients receiving radiation therapy over four consecutive weeks, and exchange of WBC in addition to vaccine injection, has prompted us to start a third program currently being utilized at Kansas University Medical Center. Credence is given to the greater effectiveness of immunotherapy utilizing exchanges by the report of Sterchi *et al.*,⁶ in which melanoma patients receiving WBC exchanges as well as vaccine injections had a much greater response rate (50%) compared to those receiving vaccine alone (17%).

Survival for that small group of patients with carcinoma of the pancreas undergoing curative resection, as well as those proved to be non-resectable, can be significantly increased by aggressive surgery in combination with adjunctive therapy. This approach has produced significant gains in survival in other cancers, such as rhabdomyosarcoma of children.⁷

Therefore, we have initiated a program at KUMC for all patients with carcinoma of the pancreas as fol-

lows: (1) either resection or bypass procedure; (2) 4000 to 5000 rads radiation therapy to the pancreas; (3) immunotherapy consisting of Vaccine II injections for 4 to 8 weeks concluded by exchange of WBC; and (4) 500 mg FU by mouth beginning with radiation therapy and continuing weekly for an indefinite period. Whether operated on at KUMC or elsewhere, all patients will be accepted for this program.

Summary

Experience with 17 patients with incurable carcinoma of the pancreas treated by radiation therapy and immunotherapy is described. Results observed have prompted a program at KUMC of aggressive surgery, radiation therapy, immunotherapy, and long-term chemotherapy. Optimism for significant palliation and survival for these patients with curable and incurable pancreatic carcinoma is warranted.

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FREE BOOKLET

HEALTH EFFECTS OF ENVIRONMENTAL POLLUTION: Illustrated 24-page color booklet describing various adverse effects that the pollution of the environment has on human beings. Particularly useful to physicians and other medical practitioners, the booklet gives the reader some insight on the role of the environment in "causing" diseases like bronchitis. Is the psyche affected by lead, or mercury, or noise exposure? Can odors hurt you? How are some chemicals not only carcinogenic, but teratogenic or mutagenic? These are the kinds of questions raised and discussed. Available free from Office of Public Affairs, Dept. MED, U. S. Environmental Protection Agency, Washington, D. C. 20460.

Emergency Cardiac Surgery

Ventricular Septal Defect and Ventricular Aneurysm

**FRANK C. BROSIUS, M.D., WILLIAM L. HAYES, M.D., ERNEST W. CROW, M.D.,
S. JAMES FARHA, M.D., and GARY B. WOOD, M.D., Wichita**

COMPLICATIONS of acute myocardial infarction include perforation of the interventricular septum and associated development of a left ventricular aneurysm. The clinical features of these anatomic complications of acute myocardial infarction have been the source of several recent reviews.¹⁻³ Reports of successful repair of these defects several weeks after the acute infarction are numerous. However, successful surgical repair of a ruptured interventricular septum within three to four weeks following an acute myocardial infarction is still infrequently reported. Wanderman, *et al.*⁴ recently reported successful repair of an interventricular septal defect nine days following acute myocardial infarction in a 71-year-old woman. More recently, Graham, *et al.*³ reviewed their experience with 12 cases operated upon within 5.4 days (average) following occurrence of ventricular septal defect (VSD) complicating acute myocardial infarction. They reported a 50 per cent mortality within the operative period, and 50 per cent survivors from 8 to 54 months. We have successfully treated such a patient with survival currently into the 37th month.

Case Report

A 64-year-old man was admitted to the hospital on January 4, 1971, with an acute antero-lateral myocardial infarction, and recovered uneventfully to be discharged on January 23, 1971. On February 6, 1971, he was again admitted to the hospital with severe lower anterior chest pain. The electrocardiogram revealed an extensive acute anterior infarction, and during the next few days he had a significant rise in the SGOT, CPK, and LDH isoenzymes. No heart murmur was present on admission, but on the next day a grade 4/6 pansystolic murmur and thrill was noted at the lower-left sternal border. The patient subsequently developed congestive heart failure with pulmonary edema. He was treated with Lanoxin and Furosemide, and his condition slowly improved. The murmur persisted and was

considered to represent acute rupture of the ventricular septum. By February 17, 1971, he was somewhat improved and was being slowly ambulated. The heart murmur had increased in intensity to 5/6. On February 19, 1971, his condition began to deteriorate. He became tachypneic and again developed cervical venous distention, sinus tachycardia, and a gallop rhythm. The liver was palpable 3 cm below the right costal margin, and there were bilateral pulmonary rales. The chest x-ray showed diffuse pulmonary edema. The patient's condition remained precarious. On February 21 and 22, episodes of ventricular fibrillation were successfully defibrillated and the patient resuscitated. Following this, he required Isuprel intravenously to maintain a blood pressure in the range of 80/60. At this time, the BUN was 83 mg/100 ml, and the patient became jaundiced with a serum bilirubin of 3.7 mg/100 ml. The chest x-ray continued to reveal intense pulmonary edema. The patient became mentally lethargic and confused; his abdomen was distended, with hypoactive bowel sounds. Despite intensive medical management, he remained in a state of chronic shock and refractory congestive heart failure.

On March 3, 1971, cardiac catheterization was carried out and a large left to right shunt at the ventricular level was demonstrated by oximetric data and by left ventriculography. The left ventriculogram also demonstrated a ventricular aneurysm in the posterolateral wall. The systolic pressure in the pulmonary artery was 55 mm of mercury, and the central venous pressure (CVP) revealed a mean value of 25 mm Hg. Selective coronary arteriography demonstrated a complete occlusion of the anterior descending branch of the left coronary artery, 2 cm distal to its origin. The left circumflex coronary artery revealed plaque formation, but no significant areas of stenosis. The right coronary artery appeared to be essentially normal. The patient was moved from the cardiac catheterization laboratory to the operating room. At surgery, the aneurysm and surrounding infarcted muscle of the ventricular wall was excised. The ventricular septal defect was closed with a dacron patch. The ventricle was closed by direct suture utilizing supporting teflon pledges. The patient was doing well at

From the Departments of Medicine and Surgery, KUMC-Wichita Branch, 2221 N. Hillside, Wichita, Kansas 67219.

Address reprint requests to: Frank C. Brosius, M.D., 3333 East Central, Suite 404, Wichita, Kansas 67208.

this point, when it was noted that a thrill was still palpable over the ventricular septum. The right ventricle was then opened and another dacron patch sewed onto the ventricular septum from the right ventricular side. The right ventricle was then closed. Immediately after surgery, the patient awakened promptly. He maintained a blood pressure in the range of 120/70. The CVP immediately after surgery was 10 cm of water. The urinary output was normal. Subsequently, his post-operative course was uneventful and he was discharged from the hospital on the 17th postoperative day.

Since that time, the patient has been followed on an outpatient basis and has gradually resumed normal activity. Until 24 months postoperatively, he remained symptom free. During the next 12 months, he experienced occasional angina and had some limitation of exercise tolerance, although recently was able to walk several blocks without symptoms, carrying a grocery sack. On recent examination in March 1974, no evidence of heart murmur, gallop rhythm, or cardiomegaly was detected. His chest x-ray revealed a normal heart size and normal pulmonary vascularity.

Discussion

The clinical picture of rupture of the interventricular septum complicating acute myocardial infarction has been well described in several recent reports. It includes the sudden appearance of a harsh holosystolic murmur, located from the left sternal border to the apex and frequently associated with a thrill. This usually occurs within the first few days after the acute infarction, averaging 3.4 days in one series,³ and 2.6 days in another.² The clinical status of the patient is worsened promptly in the vast majority of cases with development of heart failure or shock. Despite intensive medical management, 24 per cent of patients do not survive the first 24 hours, and 85 per cent die within the first two months.⁵ Acute papillary muscle rupture may present with similar, if not identical, findings as was stressed by Selzer, *et al.*,² and must be differentiated.

Acute septal rupture apparently occurs in up to 2 per cent of all patients dying of acute myocardial infarction,³ and is associated with a high incidence of ventricular aneurysm formation. It seems to occur about equally in anterior and posterior infarctions. Hemodynamic study may need to be carried out promptly if the patient's status is worsening, and should include both left ventricular angiography and coronary arteriography. Bedside diagnosis of acute VSD can be obtained utilizing Swan-Ganz catheterization,⁶ and serves to distinguish this entity from acute papillary muscle rupture of the mitral valve. Occasionally, patients will stabilize with good medical management, and long-term survivors

have been reported with medical treatment alone.^{2,7} The majority, however, will require surgical intervention after appropriate study, as indicated above. Operative mortality is highest in those cases operated within the first three to four weeks, but the survival rate is improving as techniques become more standardized. This is indicated by the Graham series³ (cited above) and by Buckley, *et al.*,⁸ who reported an average survival of 14 months in four of five cases operated within ten days of the acute infarction. Most surgeons now stress importance of a left ventricular approach with closure of the shunt and resection of the akinetic or aneurysmal area of the infarction.^{3,6,8} The utilization of teflon or dacron patches for closure of the septal defect along with teflon buttressed sutures is emphasized and was the technique utilized in the present case. Survival definitely is enhanced by resection of akinetic or aneurysmal segments and probably relates to the residual ventricular function, since the major cause of death postoperatively is heart failure.³ In patients who can be maintained with medical management, surgery may be unnecessary or may be postponed for six to eight weeks, at which time operative risk is reduced. A key point in the clinical management is recognizing when the patient's course becomes intractable to medical treatment. The majority of those with large defects and severe impairment die within the first day, as emphasized by Selzer.² The remaining patients may decline initially only to stabilize under medical treatment. Inability to maintain clinical stability may occur at any time within the first few weeks, as indicated by various reports and by this case, in which operation was performed on the 24th day following rupture. Once progressive failure or shock develop, surgical intervention should be contemplated immediately.

Summary

A 64-year-old man developed a ruptured interventricular septum following an acute myocardial infarction. On the 24th day following development of the VSD, he was operated upon in a near-moribund state, and the septal defect was closed along with resection of an associated ventricular aneurysm. The patient is alive 37 months after surgery. In addition to the case summary, a brief review of the clinical features of this condition and indications for surgery are presented.

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(Continued on page 288)

The President's Message

It was my pleasure to appear before the Kansas Democratic Party Platform Committee, where I recommended the following items.

Minority Students

An inequity which I do not consider fair is the discrimination against the students who have the scholastic ability to be admitted to medical school, in favor of the minority groups. I do not believe that our medical schools should be forced to lower their standards for admission of minorities to medical schools. This last year, the Class of 1974, 16 minority students were admitted—only a small percentage of them being Kansas residents. I am sure that the quota could have been filled by Kansas minorities if they were identified and encouraged at the high school level. To lower the standard of medicine in order to allow more minority group persons who do not possess the aptitude to be trained, can actually be dangerous to the patients they will eventually care for. Further, if such a program as I will propose to the Democratic Platform Committee should become a reality, it then would become the obligation of the practicing physicians of Kansas to single out these potential candidates in high school, and encourage them toward professional careers. I am sure that if the legislature saw fit, there could be compensatory programs for premedical minority students who have the aptitude and who, if given help during their college careers, could and would meet the high scolastic requirements for medical school, and would be admitted for their scholastic excellency rather than on the basis of second-class students. If this and a second funding proposal which I shall recommend later would become a reality, these minority students would be picked in Kansas, trained in Kansas by being given money to go through school, and would serve the minority groups in this state. We have a real need in the state of Kansas for the minority doctors and so far, to my knowledge, there has been no other state or government support for such a program.

Funding for Medical Students

At the present time under a federal law, we have programs in which medical students who do not have sufficient funding can make application and be funded by the federal government for their entire medical school career. The problem being, in order to pay off their federal loans, they have to agree to serve in deprived areas following their training, their loans being forgiven over a period of three or four years. I would further propose to Kansas Legislature and to the Democratic Platform Committee, that the state of Kansas make available to the Kansas students funds under similar conditions, so that these students could choose voluntarily which funds they wish to take, and if they took Kansas funds they would be required to pay off these loans under the same obligations as the federal funds, except that it would be in the state of Kansas where they would do their services.



Malpractice

In a more recent survey done in California, it was estimated that at least a dollar and a half of each office call was necessary to pay for the malpractice insurance the doctor carries. And it is also estimated—only an estimate—in other surveys, that a minimum of \$100 of hospitalization is used for the same reason. This being more than the usual lab tests and any number of x-rays—it may result in an extra stay in the hospital just to cover the doctor in case of a malpractice suit. If this is true, and I don't know how many admissions we have in Kansas, but if you figure that against all the admissions in emergency rooms where patients have x-rays to protect the doctor basically, this amounts to an astronomical sum which, if malpractice laws could be written in Kansas on a no-fault basis, a tremendous medical saving could be accomplished.

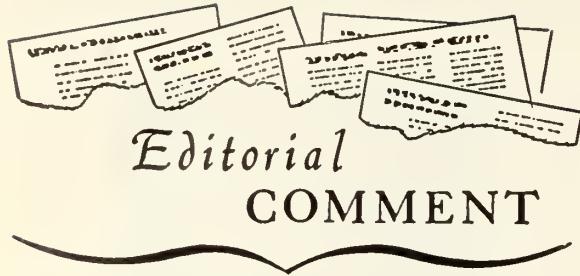
Usual and Customary Payments for Welfare Recipients of Medical Care

I suggest that the usual and customary fees for Medicare recipients should be part of this platform. This is not for the purpose of making the doctors richer, but to remove the welfare recipients and Title XIX patients from the class of second class citizens. Usual and customary fees are primarily for the patient's benefits, so that the doctors will see them and take care of them.

Highway Safety Act

It is my opinion that the Kansas Medical Society would recommend evaluations of hospitals with reference to emergency rooms, and this evaluation be posted at all major exits from the freeways as to the standing of the community hospitals. This is something that Dr. McSwain, of KUMC, last year was lobbying for in the legislature, and I am sure that the doctors in Kansas would not oppose this.

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Editorial COMMENT

To the Ladies

In case you haven't noticed (and it would be well to maintain a judicious silence if you haven't), the Woman's Auxiliary to the Kansas Medical Society is marking the 50th anniversary of its existence, a milestone the ladies are more pleased to record in their corporate state than any of the individual member would be in her personal life. However, it is a fact that age lends a veneration to organizations since organizational age indicates success of purpose and service, whereas individual age tends to herald an incipient or incumbent senility reflecting merely an innate (and depressing) physiology.

There may be some benighted physicians who presume that the prime motivation of such organizations is social—and there is no doubt that the Woman's Auxiliary enjoys a healthy social activity, but the ladies have long since left behind the struggle to decide the color scheme of the table decorations or the status to be acquired by their appearance at a social function. The services they have come to render cover the entire gamut of medical interest. They have been a strong force in the AMA-ERF effort to resolve some of the financial problems of medical education. They have worked effectively, both financially and ideologically, in the political arena. They have taken a logical and effective lead in community health, in health education, and in implementation of essential health services.

Success can be self-obscuring as it is absorbed into the homogeneity of the total effort, and perhaps this is one reason we rely on the recognition of a specified time of service to remind ourselves of the relative values of the components of that effort. We think, of course, that considering its size and problems, the Kansas Medical Society has served its members, its patients, and the cause of organized medicine well over the years. It deserves to be noted, however, that the Woman's Auxiliary holds a record at least equivalent if not superior to that of the primary organization. The state and regional groups and individual members have gained national recognition for

their efforts. Even this recognition could be accorded a deprecating or patronizing attitude if the substance of their programs was trivial or the busy-work type often associated with organizations whose reason for being is the existence of some other organization. But the Auxiliary left that organizational adolescence behind some time ago. In its maturity, its efforts range from the practicality of money-raising to the visionary (but educationally practical) effort such as the conference on the Young Family '74. One need only consider for a moment those things promoting the welfare of the patients of Kansas which would not get done if the Auxiliary were not on hand to do them. Undoubtedly, they have matched the Society by developing some intramural hassles too but, if so, they are more adept at hiding them.

The concept of a woman's auxiliary to a predominantly male organization is probably anathema to the ardent promoters of women's rights. After all, how can you be more degraded or oppressed than to have your reason for being reside in a subordinated status? This deplorable condition seems to have escaped the ladies (perhaps because they have been too busy doing jobs that need doing). They seem to have the debased notion that the social, professional, and domestic circumstance of their husbands' efforts offers a worthy and meaningful opportunity for them to accomplish things to support and advance those efforts. They fail to see that the benefits to the community through their health education and services, the appreciation and respect they inspire in their husbands is really a bitter price to pay for the tragic loss of their identities and a blatant device of a male-dominated profession to keep them in their subjugated roles. Any satisfaction they may receive, any feeling of accomplishment amounts to no more than corrupting bribery to accept their inferiority. One can only feel a sense of wonderment that such oppressed vassals can do such a remarkably good job.

Perhaps the success of the Woman's Auxiliary lies

not so much in their organizational efficiency or their conviction of the value of their work as in certain qualities to be found in the wives of physicians. It is not altogether clear whether these qualities are a dominant feature in their choosing to marry physicians, or some latent characteristics which develop under the stress of that difficult role. In other words, does a certain type of woman marry the physician, or does she become a certain type of woman as she is progressively confronted with the unique demands she has unwittingly acquired? True, today more than ever before, the wife is the primary provider until the embryonic physician is delivered, but this is not unique. This is a social trend which is reflected in numerous disciplines requiring long academic preparation. True as well, that this cooperative attitude would bring a logical fruition in a continuing melding of the effort after the physician becomes established.

But the Society-Auxiliary relationship represents a great many other combinations of circumstance, and the only answer is that something inherent in the wife accounts for an uncommon intensity of purpose, not just in auxiliary efforts but in the success of the medical marriage. There is probably no marriage which demands so much of a woman. She must have the maturity to accept the unrelenting demands on her husband—not only her personal deprivations but the added home-front responsibilities she inherits by default. She must have the emotional stamina to withstand the psychological vagaries of this individual who considers himself the most reasonable, equitable—and essential—of men. She must combine a resilient independence with a realistic execution of a shadowed role. She must be a buffer and a surrogate, a confidante of unimpeachable integrity in the face of social pressures. And she must learn to be at peace with herself as each new day brings new revelations that the simple vows she took have committed her to a life of domestic, social, and ethical relationships she dreamt not of.

It is little wonder that such unions are not always successful, and it should be recognized that those that are, owe much more to the strength of the wife than that of the husband. It is not surprising, then, that when these wives decide to direct their resources and energies toward programs of service to their husbands and the community, success is a certainty. And that the happy relationship that exists between the Medical Society and the Woman's Auxiliary owes more to the distaff side.

So we extend congratulations to the ladies of the Auxiliary. We thank them specifically and categorically for their efforts and their accomplishments. The gesture just may surprise them, being unaccustomed, as they are, to getting proper credit for being what they are.—D.E.G.

Information for Authors

Manuscript Preparation

Manuscripts must be typewritten, double spaced, leaving wide margins. Submit the original, plus one copy if possible.

Titles should be short, specific, and amenable to indexing. A subtitle is frequently used to keep the main title short.

Summary: All manuscripts should include a short abstract which is a factual (not descriptive) summary of the work.

Author Responsibility: The author is responsible for all statements made in his work, including changes made by the copy editor. Manuscripts are received with the explicit understanding that they are not simultaneously under consideration by any other publication. Publication elsewhere will be subsequently authorized at the discretion of the Editor.

Galley Proof: To make extensive changes in the article after the text has been set in type may require an additional cost which exceeds the original. The galley proof is for correction of ERRORS, and a rewriting of the article should be done on the original copy BEFORE it is submitted for publication.

Drugs should be called by their generic names; the trade names can be added in parentheses if they are considered important. All *units of measure* must be given in the metric system.

References

Bibliographic references should not exceed 20 in number, documenting key publications. Personal communications and unpublished data should not be included. References should be arranged according to the order of citation, and not alphabetically. All references must be numbered consecutively and all must be cited in the text. Use the style of the AMA publications, giving; name of author, title of article, name of periodical, volume, pages, year.

Illustrations

All material which cannot be set in type, such as photographs, line drawings, graphs, charts, tracings (for preparation of tables, see below) must be mounted on white cardboard. All must be identified on the back as to figure number, author's name, and an arrow indicating top. Legends should be typed double spaced on a separate sheet of paper, limited to a maximum of 30 words.

Drawings and graphs should be done professionally in India ink on illustration board or high grade white drawing paper.

Photographic material should be submitted in duplicate as high-contrast, glossy prints. Color illustrations will be accepted for publication only if the author assumes the cost.

THE JOURNAL will assume the cost of B/W engravings and cuts up to \$35 (or 5 cuts). Engraving cost for illustrations in excess of \$35 will be billed to the author.

Tables

Because tables are set by hand, their cost is comparable to illustrations. A reasonable number of tables are allowed without cost to the author.

Tables should be self-explanatory and should supplement, not duplicate, the text. Since the purpose of a table is to compare or classify related items, the data must be logically and clearly organized. The relationship and comparison are established by the correct choice of column heads (captions of vertical columns) and stubs (left entries in horizontal listings).

Each table should be typed double spaced, including all headings, on separate sheets of lettersize paper. Oversize paper should not be used. Instead, repeat heads and stubs on a second sheet for tables requiring extra width. Number tables consecutively. Each table must have a title.

Reprints

A reprint order form with a table covering cost will be sent with the galley proof to each contributor. Since the JOURNAL has no way to provide for reprints, they must be ordered by the author and purchased directly from the printer.

President's Message

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Outreach Program

Another thing that was discussed was the Outreach Program of residencies in Kansas. It is the considered opinion of the Kansas Medical Society that the passage of the bill allowing \$10,000 for new residencies performed throughout the state, and \$2,500 for existing residencies and pay for these residents, was one of the best laws we have had in a long time. We would further encourage the legislature to dwell on this subject and encourage towns and cities in the outlying areas to participate in this program.

Another Reorganization in State Government

The State Board of Health is one of those agencies that was reorganized. I served on that board for seven years, many years as chairman. It is my opinion—and I believe a majority of the doctors of Kansas—that while many programs are founded under the State Board of Health, the preventive programs they espouse in most cases should be in some manner worked out so that therapy becomes a method of prevention. And on a cost accounting basis, I honestly believe that there are a number of programs that if funded through doctors' offices would actually be more beneficial to the patient. If a cost accounting system were developed on all the present functions done by local boards of health—and boards of health to do only the things requiring special expertise not found in the private sectors of medicine, or which are too expensive to be done in the private sectors of medicine—the cost accounting system would eventually prove the above. Then these things which can be done more cheaply in private offices should be farmed out to these offices to be done, and be paid for by the state. Many of the laboratory functions presently performed by the state government could, I am sure, be done as cheaply or more so if done in private laboratories. I have discussed this particular matter with Dwight Metzler, the newly appointed Director of the Kansas Department of Health and Environment. I am sure, with encouragement from the legislature, he would be more than willing to do just this thing.

Director of Department of Social Welfare

The doctors of Kansas would like to be assured that the Director of the Department of Social Welfare must bargain in good faith with the private sector of medicine for medical care for welfare recipients. And if funds are not available, limiting services to top-priority cases for which the money is provided, the services should become the responsibility of county commissioners. This would be a check agent, and could accomplish the following: (1) the number of welfare cases would be limited; (2) not more could be accepted than the department had the money to pay for; (3) doctors in the past have donated millions of dollars to the needy of Kansas before welfare became a fact; without being forced by bureaucracy, they could do so again, if necessary.

Wichita State University Branch

The Kansas Medical Society supports the ongoing programs for the expansion of the medical school, with emphasis on the Wichita State University Branch. We support the acceleration of the program in Wichita.

Governor's Advisory Committee

Lastly, we suggest and support that the governor seek

an advisory committee from the private sector of medicine on public health, welfare, and environment.

President

Emergency Cardiac Surgery

(Continued from page 284)

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AMA House of Delegates

(Continued from page 14)

Reconstructive Surgery to the "Section on Plastic, Reconstructive, and Maxillofacial Surgery."

—Stipulated that Board reports nominating members of the Council on Medical Education contain a breakdown of current members' status to ensure a proper balance between fulltime educators and private practitioners.

—Rejected a proposal that AMA delegates be chosen by popular election within their respective state medical associations.

—Adopted a substitute resolution calling upon the AMA to recognize "brain death" as one of the various criteria by which death may be medically diagnosed.

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Indications: Pro-Banthine is effective as adjunctive therapy in the treatment of peptic ulcer. Dosage must be adjusted to the individual.

Contraindications: Glaucoma, obstructive disease of the gastrointestinal tract, obstructive uropathy, intestinal atony, toxic megacolon, hiatal hernia associated with reflux esophagitis, or unstable cardiovascular adjustment in acute hemorrhage.

Warnings: Patients with severe cardiac disease should be given this medication with caution.

Fever and possibly heat stroke may occur due to anhidrosis.

In theory a curare-like action may occur, with loss of voluntary muscle

control. For such patients prompt and continuing artificial respiration should be applied until the drug effect has been exhausted.

Diarrhea in an ileostomy patient may indicate obstruction, and this possibility should be considered before administering Pro-Banthine.

Precautions: Since varying degrees of urinary hesitancy may be evidenced by elderly males with prostatic hypertrophy, such patients should be advised to micturate at the time of taking the medication.

Overdosage should be avoided in patients severely ill with ulcerative colitis.

Adverse Reactions: Varying degrees of drying of salivary secretions may

Therapeutic comparisons in peptic ulcer.

Antacids have only one mode of action to relieve ulcer pain...

Pro-Banthine® has four. brand of propantheline bromide

Antacids:

Antacids relieve ulcer pain by neutralizing gastric acid. This action is relatively short-lived and they have no other mode of action.

Pro-Banthine:

Pro-Banthine suppresses gastric acid secretion. The antisecretory properties of Pro-Banthine are well established. By effectively blocking vagotonic impulses Pro-Banthine suppresses gastric secretion to reduce both total and free acid.

Pro-Banthine helps relieve pain.

Pro-Banthine relieves ulcer pain by reducing gastric secretion and the motility and spasm of the gastrointestinal tract.

Pro-Banthine reduces acidity without subsequent acid rebound. The capacity of Pro-Banthine to reduce the secretion of total and free acid in the stomach has been demonstrated in scores of studies. None has demonstrated any significant evidence of acid rebound.

Pro-Banthine activity lasts about six hours. The effect of a single therapeutic dose (15 mg.) of Pro-Banthine lasts about six hours.* Pro-Banthine P.A.®, the prolonged-acting form, is active from 8 to 12 hours. Thus Pro-Banthine may be used to suppress acid, spasm, and pain around the clock, even during the sleeping hours when antacids, to be effective, must be taken almost hourly.

*Innes, I. R., and Nickerson, M., in Goodman, L. S., and Gilman, A. (editors): *The Pharmacological Basis of Therapeutics*, ed. 4, New York, The Macmillan Company, 1970, p. 537.

Pro-Banthine complements and enhances the action of antacids.

SEARLE

Searle & Co.
San Juan, Puerto Rico 00936

Address medical inquiries to: G. D. Searle & Co.
Medical Department, Box 5110, Chicago, Ill. 60680

occur as well as mydriasis and blurred vision. In addition the following adverse reactions have been reported: nervousness, drowsiness, dizziness, insomnia, headache, loss of the sense of taste, nausea, vomiting, constipation, impotence and allergic dermatitis.

Dosage and Administration: The recommended daily dosage for adult oral therapy is one 15-mg. tablet with meals and two at bedtime. Subsequent adjustment to the patient's requirements and tolerance must be made.

Pro-Banthine P.A.—Each tablet of Pro-Banthine P.A. (propantheline bromide) contains 30 mg. of the drug in the form of sustained-release or

timed-release beads; on ingestion about half of the drug is released within an hour and the remainder continuously as earlier increments are metabolized. Thus the result is even, high-level anticholinergic activity maintained all day and all night in most patients with only two tablets daily. Some patients may require one tablet every eight hours.

The contraindications and precautions applicable to Pro-Banthine 15 mg. should be observed.

How Supplied: Pro-Banthine is supplied as tablets of 15 and 7.5 mg., as prolonged-acting tablets of 30 mg. and, for parenteral use, as serum-type vials of 30 mg.

The Role of the *Detail Man*



Dr. Willard Gobbell
Family Physician
Encino, California



Dr. Jeremiah Stamler
Chairman
Department of Community
Health and Preventive
Medicine, and Dingman
Professor of Cardiology
Northwestern University
Medical School

"I may be prejudiced, but I am very much in favor of the detail men I meet. Most of them are knowledgeable about the drugs they promote and can be a great help in acquainting me with new medication."

Family Physician's Perception

I think that most general practitioners in this area feel as I do about the detail man. Over the years I have gotten to know most of the men who visit me regularly and they in turn have become aware of my particular interests and the nature of my practice. They, therefore, limit their discussion as much as possible to the areas of interest to me. Since I usually see the same representative again in future visits, it is in his best interest to supply me with the most honest, factual, as well as up-to-date information about his products.

"In the total picture of dealing with health problems in this country there is a potential for detail men to play a meaningful role."

The Positive Influence

My contact with representatives and salesmen of the pharmaceutical industry is the type of contact that people in a medical center, research people, and academic people have and that's in all likelihood on a somewhat different level from that of the practicing physician.

Let me touch on how I personally perceive the role of the sales representative. These men reach large numbers of health professionals. Thus they could be—and at times actually are—disseminators of useful information. They could consistently serve a real educational function in their ability to discuss their products.

At present they do distribute printed material, brochures and pamphlets—some of it scientifically sound and therefore truly useful—as well as some excellent films produced by the pharmaceutical industry. When they function in this

Opinion & Dialogue

Is He a Source of Information?

Yes, with certain reservations. The average sales representative has a great fund of information about the drug products he is responsible for. He is usually able to answer most questions fully and intelligently. He can also supply reprints of articles that contain a great deal of information. Here, too, I exercise some caution. I usually accept most of the statements and opinions that I find in the papers and studies which come from the larger teaching facilities. It goes without saying that a physician should also rely on other sources for his information on pharmacology.

Training of Sales Representatives

Ideally, a candidate for the position as a sales representative of a pharmaceutical company should be a graduate pharmacist who has a questioning mind. I don't think this is possible in every case, and so it becomes the responsibility

of the pharmaceutical company to train these individuals comprehensively. It is of very great importance that the detail man's knowledge of the product he represents be constantly reviewed as well as updated. This phase of the sales representative's education should be a major responsibility of the medical department of the pharmaceutical company.

I am certain that most of these companies take special care to give their detail men a great deal of information about the products they produce—information about indications, contraindications, side effects and precautions. Yet, although most of the detail men are well informed, some, unfortunately, are not. It might be helpful if sales representatives were reassessed every few years to determine whether or not they are able to fulfill their important function. Incidentally, I feel the same way about periodic assessments of everyone

in the health care field, whether they be general practitioners, surgeons or salesmen.

Value of Sampling

I personally am in favor of limited sampling. I do not use sampling in order to perform clinical testing of a drug. I feel that drug testing should rightly be left to the pharmacology researcher and to the large teaching institutions where such testing can be done in a controlled environment.

I do not use samples as a "starter dose" for my patients. I do, however, find samples of drugs to be of value in that they permit me to see what the particular medication looks like. I get to see the various forms of the particular medication at first hand, and if it is in a liquid form I take the time to taste it. In that way I am able to give my patients more complete information about the particular medications that I prescribe for them.

Capacity they are indeed useful; particularly in the fact that they disseminate broadly based educational material and serve not just "pushers" of their drugs.

The Other Side of the Coin

Obviously, the pharmaceutical companies are not producing all this material as a labor of love—they are in the business of selling products for profit. In this regard the ambitious and improperly motivated sales representative can exert a negative influence on the practicing physician, both by presenting a one-sided picture of his product, and by encouraging the practitioner to depend too heavily on drugs for his total therapy. In these ways, the salesman has often distorted objective reality and undermined his potential role as an educator.

The Industry Responsibility

Since the detail man must be an information resource as well as a representative of his particular pharmaceutical company, he should be carefully selected and

thoroughly trained. That training, however, must be an ongoing one. There must be a continuing battle within and with the pharmaceutical industry for high quality not only in the selection and training of its sales representatives, but also in the development of all of its promotional and educational material.

The industry must be ready to accept constructive as well as corrective criticism from experts in the field and consumer spokesmen, and be willing to accept independent peer review. The better educated and prepared the salesman is, the more medically accurate his materials, the better off the pharmaceutical industry, health professionals and the public—i.e., the patients—will be.

Physician Responsibility

The practicing physician is in constant need of up-dated information on therapeutics, including drugs. He should and does make use of drug information and answers to specific questions supplied by the pharmaceutical representative. However, that informa-

tion must not be his main source of continuing education. The practitioner must keep up with what is current by making use of scientific journals, refresher courses, and information received at scientific meetings.

The practicing physician not only has the right, but has the responsibility to demand that the pharmaceutical company and its representatives supply a high level of valid and useful information. I feel certain that if such a high level is demanded by the physician as well as the public, this demand will be met by an alert and concerned pharmaceutical industry.

From my experience, my impression is that sectors of the pharmaceutical industry are indeed ethical. I challenge the industry as a whole to live up to that word in its finest sense.



The more physicians consider the hemodynamics of lowering blood pressure...

Most physicians now agree on the importance of reducing blood pressure in the hypertensive patient. But high blood pressure exists, of course, only as part of a complete clinical picture. The hemodynamic profile of well-established essential hypertension is characterized by elevated arterial blood pressure, normal cardiac output, and increased total peripheral resistance.

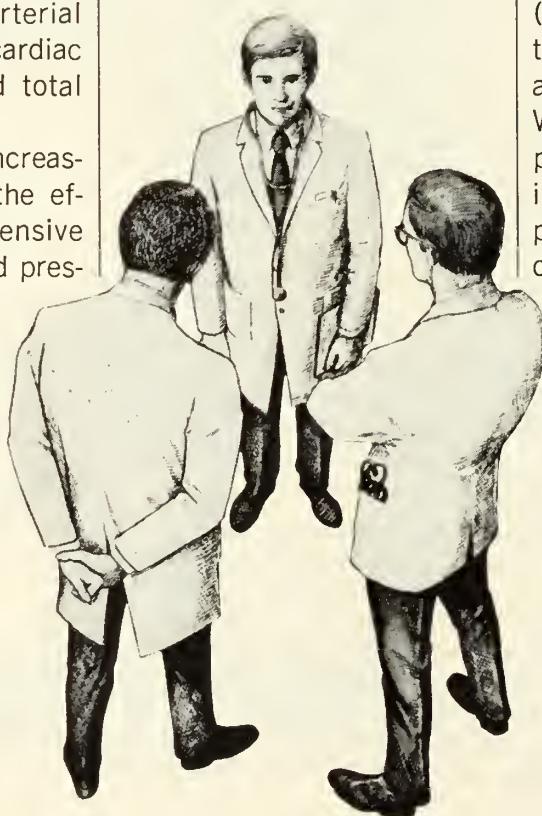
And so, physicians are increasingly concerned with the effects of an antihypertensive agent not only on blood pres-

sure itself but also on the hemodynamic pattern—in short, with the total effect of the drug. Does it indeed help lower blood pressure effectively? Is peripheral resistance reduced? Are cardiac output and renal functions main-

tained? And, also, is there likely to be drug-induced postural hypotension serious enough to pose a threat to the patient's cerebrovascular status?

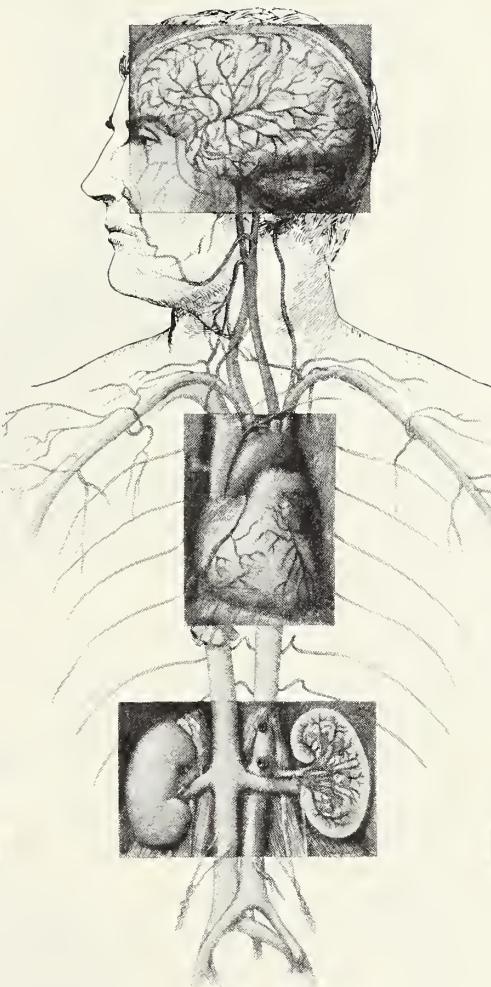
With this emphasis on overall drug performance has come a growing reliance on ALDOMET® (Methyldopa, MSD) in the treatment of sustained moderate hypertension.

With its unique hemodynamic profile, ALDOMET has drawn increasing attention and approval from physicians. First, of course, for its efficacy in



the more physicians rely on this unique antihypertensive

lowering blood pressure. But there are other considerations as well. Cardiac output is usually maintained with no cardiac acceleration; in some patients the heart rate is actually slowed. Peripheral resistance is apparently reduced. ALDOMET does not usually compromise existing renal function; it generally does not reduce renal blood flow, glomerular filtration rate, or filtration fraction. And ALDOMET usually does not cause symptomatic postural or exercise hypotension.



Contraindications include active hepatic disease and known sensitivity to the drug. Use with caution in patients with a history of liver disease or dysfunction. Not recommended in pheochromocytoma or pregnancy. It is important to recognize that a positive Coombs test, hemolytic anemia, and liver disorders may occur with methyldopa therapy. The rare occurrences of hemolytic anemia or liver disorders could lead to potentially fatal complications unless properly recognized and managed. For more details see the brief summary of prescribing information.

In most cases of sustained moderate hypertension

TABLETS, 250 mg and 500 mg

ALDOMET®
(METHYLDOPA | MSD)
smoothly lowers blood pressure

NEW
now available in
500 mg TABLETS
as well as the standard
250-mg tablets

For a brief summary of prescribing information,
please see following page.

addendum

**In most cases of
sustained moderate hypertension**

ALDOMET[®] **(METHYLDOPA MSD)**

smoothly lowers blood pressure

Contraindications: Active hepatic disease, such as acute hepatitis and active cirrhosis. Known sensitivity. Not recommended in pheochromocytoma. Unsuitable in mild or labile hypertension responsive to mild sedation or thiazide therapy. Use cautiously in patients with history of previous liver disease or dysfunction.

Warnings: It is important to recognize that a positive Coombs test, hemolytic anemia, and liver disorders may occur with methyldopa therapy. The rare occurrences of hemolytic anemia or liver disorders could lead to potentially fatal complications unless properly recognized and managed. Read this section carefully to understand these reactions.

With prolonged methyldopa therapy, 10% to 20% of patients develop a positive direct Coombs test, usually between six and twelve months of therapy. Lowest incidence is at daily dosage of 1 g or less. This on rare occasions may be associated with hemolytic anemia, which could lead to potentially fatal complications. One cannot predict which patients with a positive direct Coombs test may develop hemolytic anemia. Prior existence or development of a positive direct Coombs test is not in itself a contraindication to use of methyldopa. If a positive Coombs test develops during methyldopa therapy, determine whether hemolytic anemia exists and whether the positive Coombs test may be a problem. For example, in addition to a positive direct Coombs test there is less often a positive indirect Coombs test which may interfere with cross matching of blood.

At the start of methyldopa therapy, it is desirable to do a blood count (hematocrit, hemoglobin, or red cell count) for a baseline or to establish whether there is anemia. Periodic blood counts should be done during therapy to detect hemolytic anemia. It may be useful to do a direct Coombs test before therapy and at six and twelve months after the start of therapy. If Coombs-positive hemolytic anemia occurs, the cause may be methyldopa and the drug should be discontinued. Usually the anemia remits promptly. If not, corticosteroids may be given and other causes of anemia should be considered. If the hemolytic anemia is related to methyldopa, the drug should not be reinstated. When methyldopa causes Coombs positivity alone or with hemolytic anemia, the red cell is usually coated with gamma globulin of the IgG (gamma G) class only. The positive Coombs test may not revert to normal until weeks to months after methyldopa is stopped.

Should the need for transfusion arise in a patient receiving methyldopa, both a direct and an indirect Coombs test should be performed on his blood. In the absence of hemolytic anemia, usually only the direct Coombs test will be positive. A positive direct Coombs test alone will not interfere with typing or cross matching. If the indirect Coombs test is also positive, problems may arise in the major cross match and the assistance of a hematologist or transfusion expert will be needed.

Fever has occurred within first three weeks of therapy, sometimes with eosinophilia or abnormalities in liver function tests, such as serum alkaline phosphatase, serum transaminases (SGOT, SGPT), bilirubin, cephalin cholesterol flocculation, prothrombin time, and bromsulphalein retention. Jaundice, with or without fever, may occur, with onset usually in the first two to three months of therapy. Rarely fatal hepatic necrosis has been reported. These hepatic changes may represent hypersensitivity reactions; periodic determination of hepatic function should be done particularly during the first six to twelve weeks of therapy or

whenever an unexplained fever occurs. If fever, abnormalities in liver function tests, or jaundice appear, stop therapy with methyldopa. If caused by methyldopa, the temperature and abnormalities in liver function characteristically have reverted to normal when the drug was discontinued. Methyldopa should not be reinstated in such patients. Rarely, reversible reduction in leukocyte count with primary effect on granulocytes has been seen. Reversible thrombocytopenia has occurred rarely. When used with other antihypertensive drugs, potentiation of antihypertensive effect may occur.

Use in Pregnancy and Childbearing Age—Not recommended in pregnancy. In women of childbearing age, weigh potential benefits against possible fetal hazards.

Precautions: Methyldopa may interfere with measurement of: uric acid by the phosphotungstate method, creatinine by the alkaline picrate method, and SGOT by colorimetric methods. Since methyldopa causes fluorescence in urine samples at the same wavelengths as catecholamines, spuriously high levels of urinary catecholamines may be reported. This will interfere with the diagnosis of pheochromocytoma. Stop drug if involuntary choreoathetotic movements occur in patients with severe bilateral cerebrovascular disease. Patients may require reduced doses of anesthetics; hypertension occurring during anesthesia usually can be controlled with vasopressors. Hypertension has occurred after dialysis in patients on methyldopa because the drug is removed by this procedure.

Adverse Reactions: Sedation, usually transient, may be seen during initial therapy or when dosage is increased. Headache, asthenia, or weakness may be noted as early, transient symptoms. Symptoms associated with effective lowering of blood pressure are occasionally seen and include dizziness, lightheadedness, and symptoms of cerebrovascular insufficiency. Angina pectoris may be aggravated. Symptoms of orthostatic hypotension may occur; if symptoms occur, reduction of dosage is suggested. Bradycardia, nasal stuffiness, mild dryness of mouth, and gastrointestinal symptoms including distention, constipation, flatulence, and diarrhea occur occasionally; these generally can be relieved by reducing dosage. Nausea and vomiting have been reported in only a few patients. Sore tongue or "black tongue," pancreatitis, and inflammation of salivary glands may occur.

Weight gain and edema occur infrequently and are relieved by administering a thiazide diuretic; if edema progresses or signs of pulmonary congestion appear, discontinue drug. A rise in BUN has been observed. Other rare reactions include breast enlargement, lactation, impotence, decreased libido, skin rash, mild arthralgia, myalgia, paresthesias, Bell's palsy, parkinsonism, psychic disturbances including nightmares, reversible mild psychoses or depression. Urine exposed to air after voiding may darken because of breakdown of methyldopa or its metabolites.

Note: Dosage should be limited initially to 500 mg daily when following previous antihypertensive agents other than thiazides. Maximal recommended daily dose is 3.0 g. Patients with impaired renal function may respond to smaller doses than patients with normal kidney function. Syncope in older patients has been related to increased sensitivity in those with advanced arteriosclerotic vascular disease; this may be avoided by lower doses. Tolerance occasionally seen either early or late, but more likely between second and third month after initiation of therapy; increased dosage or combined therapy with a thiazide frequently restores effective control.

How Supplied: Tablets, containing 250 mg methyldopa each, in single-unit packages of 100 and bottles of 100 and 1000; Tablets, containing 500 mg methyldopa each, in single-unit packages of 100 and bottles of 100.

*For more detailed information, consult your MSD representative or see full prescribing information.
Merck Sharp & Dohme, Division of Merck & Co., Inc.,
West Point, Pa. 19486*

"Required Reading" For Your Hypertensive Patients



Because of the importance of patient motivation, Merck Sharp & Dohme offers "High Blood Pressure," a concise, pocket-sized booklet that defines the patient's own role in the management of hypertension. This booklet is available for you to give to your patients. It is designed to reinforce your explanation of hypertension and it emphasizes the importance of patient understanding in adhering to the regimen you prescribe.

Please ask your Merck Sharp & Dohme Professional Representative or write Professional Service Department, West Point, Pa. 19486 for a supply of this booklet.

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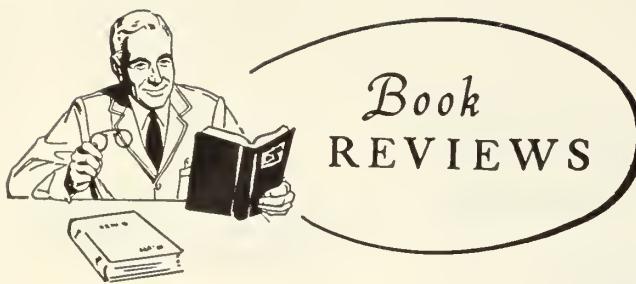
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World Wide Health Care Air Force

[a]



PARENTS' GUIDE TO ALLERGY IN CHILDREN, by Claude A. Frazier, M.D. Doubleday & Co., Inc., New York. 1973. 338 pages. \$7.95.

Claude Frazier has a way of describing and explaining allergic diseases which makes them seem so simple. In this, his most recent publication, he uses words and phrases easily understood by everyone, including the children he is describing.

Subjects covered start with "Allergy—a Panoramic View," and move through a description of the characteristics of allergic patients and their families, a discussion of their allergic diseases, to giving information which mother and the physician can use to relieve the patient. Each chapter is then summarized in a few short sentences, numbered for special emphasis. The book ends with a very complete subject index.

All who have attempted to explain allergic diseases to the parents of a sneezing, wheezing or scratching child, should welcome this aid to explaining these problems to anxious parents.—R.E.B.

QUESTIONS AND ANSWERS ON CONTACT LENS PRACTICE, 2nd Edition, by Jack Hartstein, M.D. The C. V. Mosby Company, St. Louis. 1973. 254 pages. \$12.75.

It is always interesting and embarrassing reviewing the second edition of a book to learn what you have forgotten after reading the first. Such was the case when this reviewer had the opportunity to read Dr. Jack Hartstein's latest edition on contact lens work. He is widely known for his experience with contact lenses and in this book has maintained the interesting format of questions with answers. The publishers have tried to maintain the book at approximately the same size as the last. They have done this with the use of smaller print and more lines to the page which, fortunately, has not affected its readability. There are two new chapters in the book which are mentioned in the preface. The first one is about the control of myopia with contact lenses. This reviewer personally feels that it is a detraction to have included and given this material the weight of a full chapter heading when the chapter is devoted primarily to the definition of myopia and is only two pages long. The theories presented under this controversial title are

not substantiated with references. It is suggested the author change the title to correspond to the others—the use of contact lenses in other refractive errors—or complete the chapter. The second new area concerns the hydrophilic lenses. It describes in detail their development and manufacture, however, fitting and followup techniques would have to be gleaned from other chapters in this book or from information supplied by the manufacturer of those particular lenses.

There is a better chapter on the use of keratometric methods, in that more modalities for measuring the front surface of the cornea are described. The second edition describes in more detail the variety of solutions used with the care, sterilization, and protection of the eye. A larger appendix helps in the ready reference to tables and terminology.

Missing are the "complications to contact lens wear." Although intermittently covered under other titles, a reference book on contact lens practice should include it separately.

The most interesting section is on the use of soft lenses in the condition of keratoconus. This obviously must still be experimental, since neither the Bausch and Lomb or Griffin lens have been released for use in this type of condition. The contact lens practitioner should have one or the other editions in his library, since they serve as a good reference to affirm basic fitting techniques. For that reason, they are especially good for residents and contact lens technicians in training.—F.R.A.

THE CARBO-CALORIE DIET, by Donald S. Mart. Doubleday & Co., Inc., New York, 1973. 114 pages. \$.95.

This volume claims to have solved the secret of dieting by introducing a new unit called the carbo-calorie, which is derived by a mathematical formula conceived by the author. A long list of food and beverages, including alcoholic beverages, are given a numerical value for a designated serving or volume, and by limiting the total food intake to 100 carbo-calories a day, weight loss is said to be a certainty. It would seem more complicated to learn a new system than to use 16 calorie

(Continued on page 25)

AGGRESSION IN CHILDREN

"If you believe there's a link between cigarette smoking and cancer, then you probably ought to believe there's link between watching TV violence and human aggression."

That is the "cautious conclusion" of a communications researcher writing about the effect of televised violence in children in a recent issue of *News & Comment*, the monthly membership publication of the American Academy of Pediatrics.

Noting that "violence in our society is becoming a major health problem," Randall P. Harrison, Ph.D., said that "the average American child between the ages of five and 15 sees some 13,400 human beings destroyed on his television screen. In growing up, the typical child spends as much time with television as he does in our educational system. He spends more of his waking hours watching TV than in any other single activity."

Does the viewing of this much violence cause aggressive behavior in children? Dr. Harrison said the research indicates it does.

Referring to studies done under the auspices of the U. S. Surgeon General in 1969-1970, Dr. Harrison said that "again and again, even small doses of violence led to measurable increases in antisocial behavior. These effects were not limited to a few children. They were not limited to children who were disturbed or abnormal. The effects can be demonstrated in children you see every day."

In another study referred to by Dr. Harrison, researchers went back and studied the same children ten years after they had participated in a study of televised violence in the third grade.

"The research design is complex," Dr. Harrison said, "but it appears that there is a causal link between the amount of TV violence a child sees at eight or nine and the aggressiveness he exhibits at 18 or 19. In short, if your eight-year-old watches lots of TV violence, you can predict—better than chance—that you'll shape him into an aggressive adult."

Dr. Harrison urged further research into the effects of TV violence, and urged the Academy's members to become actively involved in dealing with the problem of TV and aggression. "While television is by no means the only, or even the major, factor contributing to strife in our society, it is a factor about which we now know a great deal. Hopefully, as we learn more we can increasingly use this great communication resource in a way which will build healthier children and happier human beings," Dr. Harrison concluded.

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What's on your patient's face...

may be more important than his chief complaint

Patient P.T.* seen on 3/29/67 shows typical lesions of moderately severe keratoses. Note residual scarring on ridge of nose from previous cryosurgical and electrosurgical procedures.



Patient P.T.* seen on 6/12/67, seven weeks after discontinuation of 5% FU cream. Reaction has subsided. Residual scarring not seen except that due to prior surgery. Inflammation has cleared and face is clear of keratotic lesions.

*Data on file,
Hoffmann-La Roche
Inc., Nutley, N.J.



The lesions on his face are solar/actinic— so-called "senile" keratoses... and they may be premalignant.

Solar, actinic or senile keratoses

These lesions may be called by several names, but they usually can be identified by the following characteristics. The typical lesion is flat or slightly elevated, of a brownish or reddish color, papular, dry, rough, adherent and sharply defined. They commonly occur as multiple lesions, chiefly on the exposed portions of the skin.

Sequence of therapy— selectivity of response

After several days of therapy with Efudex® (fluorouracil), erythema may begin to appear in the area of the lesions; this reaction usually reaches its height of unsightliness and discomfort within two weeks, declining after discontinuation of therapy. This reaction occurs in affected areas. Since the response is so predictable, lesions that do not respond should be biopsied.

Acceptable results

Treatment with Efudex provides highly favorable cosmetic results. Incidence of scarring is low. This is particularly important with multiple facial lesions. Efudex should be applied with care near the eyes, nose and mouth.

Before prescribing, please consult complete product information, a summary of which follows:

Indications: Multiple actinic or solar keratoses.

Contraindications: Patients with known hypersensitivity to any of its components.

Warnings: If occlusive dressing used, may increase inflammatory reactions in adjacent normal skin. Avoid prolonged exposure to ultraviolet rays. Safe use in pregnancy not established.

Precautions: If applied with fingers, wash hands immediately. Apply with care near eyes, nose and mouth. Lesions failing to respond or recurring should be biopsied.

Adverse Reactions: Local—pain, pruritus, hyperpigmentation and burning at application site most frequent; also dermatitis, scarring, soreness and tenderness. Also reported—insomnia, stomatitis, suppuration, scaling, swelling, irritability, medicinal taste, photosensitivity, lacrimation, leukocytosis, thrombocytopenia, toxic granulation and eosinophilia.

Dosage and Administration: Apply sufficient quantity to cover lesion twice daily with nonmetal applicator or suitable glove. Usual duration of therapy is 2 to 4 weeks.

How Supplied: Solution, 10-ml drop dispensers—containing 2% or 5% fluorouracil on a weight/weight basis, compounded with propylene glycol, tris(hydroxymethyl)-aminomethane, hydroxypropyl cellulose, parabens (methyl and propyl) and disodium edetate.

Cream, 25-Gm tubes—containing 5% fluorouracil in a vanishing cream base consisting of white petrolatum, stearyl alcohol, propylene glycol, polysorbate 60 and parabens (methyl and propyl).



Roche Laboratories
Division of Hoffmann-La Roche Inc.
Nutley, N.J. 07110

This patient's lesions were resolved with **Efudex®** **fluorouracil/Roche®**

5% cream/solution...a Roche exclusive

KANSAS STATE DEPARTMENT OF HEALTH

TOPEKA, KANSAS

Epidemiology & Disease Control Services—Registration & Health Statistics Services—Kansas Morbidity Incidence
Summary of Cases Reported in October, 1973 and 1972

Diseases	October			January-October Inclusive		
	1973	1972	5-Year Median 1969-1973	1973	1972	5-Year Median 1969-1973
Amebiasis	3	3	3	20	32	20
Aseptic meningitis	—	20	3	4	31	12
Brucellosis	2	—	—	2	1	1
Diphtheria	—	—	—	—	—	—
Encephalitis, prim., infect.	—	—	—	11	8	11
Encephalitis, post-infect.	—	1	—	2	8	2
Gonorrhea	790	736	719	6,800	7,055	6,233
Hepatitis, infectious	45	32	32	462	431	431
Measles (Rubeola)	—	10	1	17	37	37
Meningococcal meningitis	2	1	1	12	16	15
Mumps	17	22	17	805	686	686
Pertussis	—	—	—	6	8	8
Poliomyelitis	—	—	—	—	—	—
Rheumatic fever	5	—	—	38	1	4
Rubella (German Measles)	—	—	—	62	196	62
Salmonellosis	34	69	34	268	374	268
Scarlet fever	—	5	3	28	36	36
Shigellosis	13	43	34	227	446	227
Streptococcal infections	656	471	471	7,713	4,977	4,095
Syphilis	119	89	119	990	1,079	1,162
Tinea capitis	11	4	4	26	25	26
Tuberculosis	10	14	14	152	167	167
Tularemia	—	2	—	1	6	3
Typhoid fever	—	—	—	4	3	—

TO ALL MEMBERS OF THE KANSAS MEDICAL SOCIETY

This is a reminder that the Fall House of Delegates meeting will be on Sunday, November 3, 1974, the time and place to be announced later. Due to the lack of time, the only resolutions to be considered at this meeting will be those dealing with legislative matters or those considered urgent. All others will be held over until the Annual Session in May.

In order to give the members a chance to study the issues prior to the meeting, the resolutions should be submitted to the Kansas Medical Society office before October 15, 1974.

CLAIR C. CONARD, M.D., *Speaker*

Book Reviews

(Continued from page 20)

points for a 1,200 calorie diet, as is given in the Kansas Diet Manual. So far as this volume being the panacea for obesity, one must remember that literally thousands of diets have been proposed but not followed more than a very short time; that the average dieter soon loses interest unless he or she has tremendous incentive or persistence or repeated counseling with a physician, dietician, or an organization dedicated to dieting. The latter could be very efficient, just as Alcoholics Anonymous have helped many alcoholics.

Dedication to achieve the weight loss desired and to maintain a proper weight level is the hallmark of success, whether the diet be carbo-calorie, calorie counting or other, but, please, not crash diets, which are so commonly found in the lay press.—G.W.H.

CURRENT SURGICAL DIAGNOSIS AND TREATMENT, 12th Edition, J. Englebert Dunphy, M.D. and Lawrence W. Way, M.D. Lange Medical Publications, Los Altos, Cal., 1973. 1,108 pages. \$14.00.

This soft-bound book of 1,108 pages appears to be the surgical companion of the *Current Diagnosis and Treatment* of the same publishers. It is written by some 62 contributors, of whom all but a few are members of the faculty of the University of California School of Medicine at San Francisco.

This book is intended to be useful to both medical students and practicing surgeons, and should fulfill this hope. The first chapters deal with general surgical principles—the approach to the patient (taking a history and doing a physical examination), preoperative and post-operative care, complications, special medical problems encountered in surgical patients, a discussion of pertinent legal medicine, principles of radiation therapy and nuclear medicine, wound healing, surgical infections, fluid and electrolyte therapy, anesthesia principles, shock, etc. Later there are chapters devoted to specific diseases or regions or systems.

This reviewer was really impressed by the selection of significant material, presented without a lot of "padding," and the practical and concise way in which it was given. It is written to be useful as problems are actually encountered, "making do" with what is available or practical, and recognizing that for some situations it is not possible, for example, to take a complete history or do a complete examination, or have full laboratory or radiological studies, and that at times one must settle for less than optimal conditions, procedures, and equipment.

Basic principles, basic pathological physiology, and pathological anatomy are emphasized; appropriate useful diagnostic procedures and tests are given in required detail; but operative technique is not an objective and is not included.

In short, the editors have done an excellent job of making a comprehensive presentation of an enormous subject in one volume, at the same time (and necessarily) eliminating chaff to keep the length within reason. Most of it is good reading, and the rest is good reference material. It should be useful to many people for what it is—a workable summary of surgical diagnosis and treatment—but should not be regarded as a replacement for all surgical texts and journals.—O.R.C.



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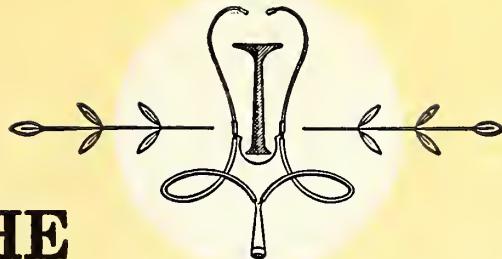
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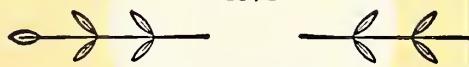
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For further information on this subject, the following references are provided:

1. Henry BW, et al: *Dis Nerv Syst* 30:675-679, Oct 1969.
2. Hollister LE, et al: *Arch Gen Psychiatry* 24:273-278, Mar 1971.
3. Claghorn J: *Psychosomatics* 11:438-441, Sept-Oct 1970.



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The JOURNAL of the KANSAS MEDICAL SOCIETY

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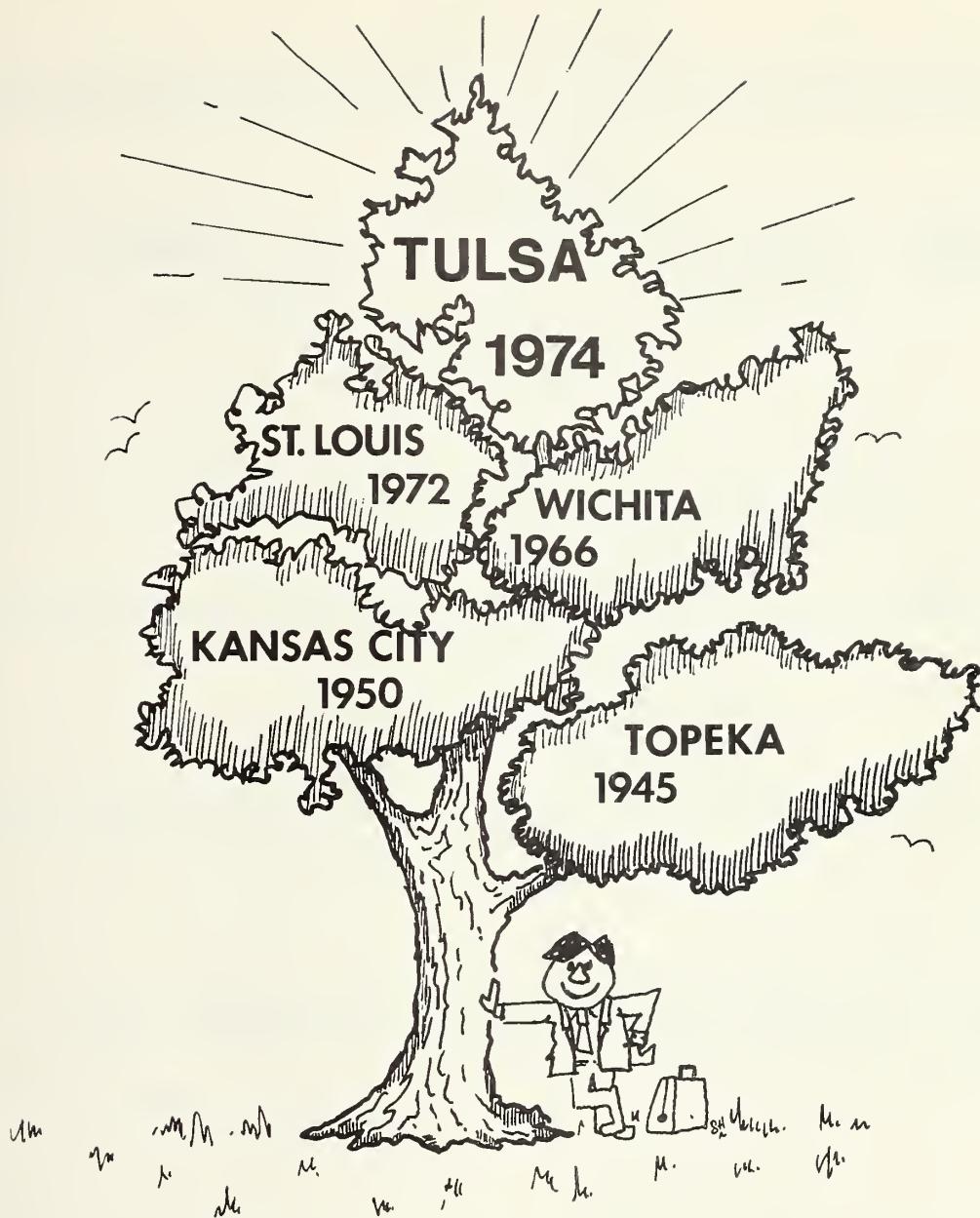
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2. Many of the incumbents are not returning to our national Congress because they feel incapable of understanding the bills on which they must cast a knowledgeable vote. Alas, 10,000 words to make one point!!
3. Self-appointed experts of all breeds have been writing, speaking, and acting for the medical profession because the true medical voice has never been heard. Our true feelings must be shouted through bull horns so loud that these do-gooding bad-doers are shelved.
4. The swelling tide of public opinion is not against the patient's personal physician. It flows and ebbs with antagonisms conjured up by ill-informed perpetrators whose sympathies are not expressly for our patients, but nearly always derogatory to organized medicine and free enterprise.
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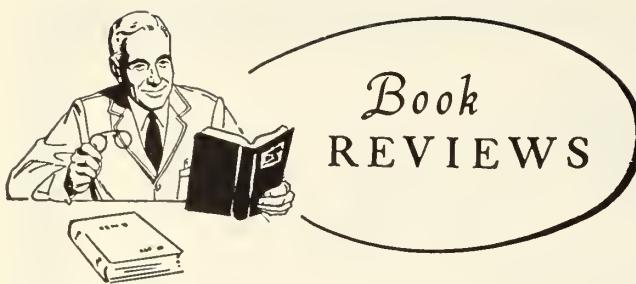
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HANDBOOK OF OCULAR THERAPEUTICS AND PHARMACOLOGY, 4th Edition, by Philip P. Ellis, M.D. and Donn L. Smith, M.D., Ph.D. The C. V. Mosby Co., St. Louis. 1973. 262 pages. \$14.75.

As the title indicates, this is strictly a handbook presented in a two-part format. It is written and organized to serve as a quick reference to help in the selection of drugs—their dosage and possible side effects—in treating various ocular diseases.

The first section deals with therapeutics presenting some basic considerations of treatment and parameters used in the therapy of most ocular disorders. It is up to date, as it discusses the application of drugs via the use of hydrophylic contact lenses soaked in specific drugs, also the use of conjunctival inserts for sustained release of a specific drug. The use of BCNU in the treatment of melanomas is also mentioned. The chapter divisions deal effectively with diseases affecting specific anatomical areas of the eye, as well as the more common eye diseases. At the end of each chapter is a bibliography documenting the source of the material presented, thus affording an opportunity to check a more exhaustive presentation of therapy when dictated in the care of a specific disease entity.

Section 2 deals with pharmacology and therapeutic agents—the actions, uses, side reactions and contra-indications, as well as specific dosages of drugs recommended to be used, although this presentation is rather concise and at the same time rather concentrated. However, it presents itself as a valuable reference manual when faced with having to treat infectious problems. One table lists most of the ocular microbial pathogens and the various drugs they are most likely to be sensitive to. Another table presents an extensive list of antibiotics with dosages in their different routes of administration and their possible side effects.

Though this handbook is designed to be most valuable to the practicing ophthalmologist, it will also serve as a quick reference manual for other practitioners who have occasion to be better acquainted with ocular side effects of various drugs and medications used in their armamentarium.—W.A.H.

SYMPOSIUM ON AESTHETIC SURGERY OF THE FACE, EYELID, AND CHIN, by Frank W. Master, M.D., and John R. Lewis, Jr., M.D. The C. V. Mosby Co., St. Louis, 1973. 207 pages, 514 illustrations. \$37.50.

Upon thoroughly reviewing this book, it is the opinion of the reviewer that it should be considered a very excellent book, from the plastic surgery point of view.

Not only does it cover the chapters well, and categorizes the subject by various specialists; the authors also brought about various problems of their specific surgery, operation, and their own way of solving these complications.

This book is not considered elementary in its level for the student, but it is excellent for the plastic surgeon who has finished his residency and has had enough plastic surgery experience to encounter the different complications.—R.C.Y.

WHAT TO DO ABOUT YOUR BRAIN-INJURED CHILD, by Glenn Doman. Doubleday & Co., Inc., New York. 1974. 291 pages. \$7.95.

This book filled the reviewer with ambivalence and misgivings. It is a book written to and for the parents of brain damaged children and, while there are many good features about it, the author has set himself a formidable task of trying to cover a large and complex subject in a relatively small compass—and he does not succeed.

There are large gaps left uncovered and there are some areas which might well have been omitted. There is biography in it, there is history in it, and there is even some autobiography in it, all mixed in with information on the Doman-Delcato methods of "patterning," a technique which—while it admittedly has value—has its drawbacks and limitations. These latter, however, are either ignored or glossed over and this, taken with the evangelical-cultist style of the author, led this reviewer to conclude that the aim is to appeal on a popular level to parents and others who, because of the tragic problems they have to face, are particularly vul-

(Continued on page 13)

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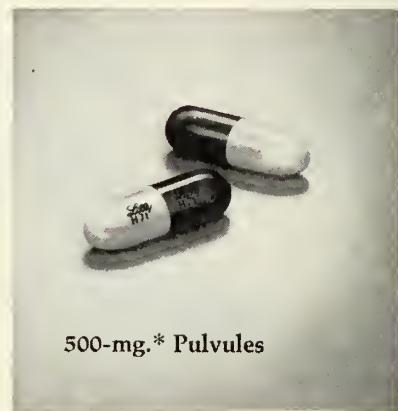
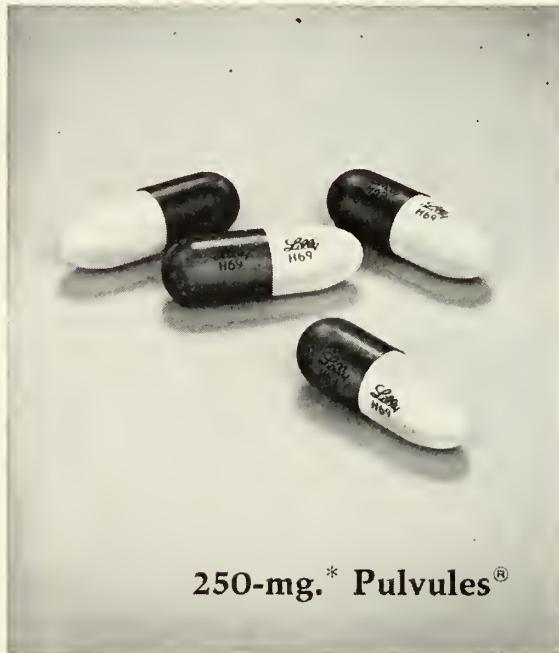
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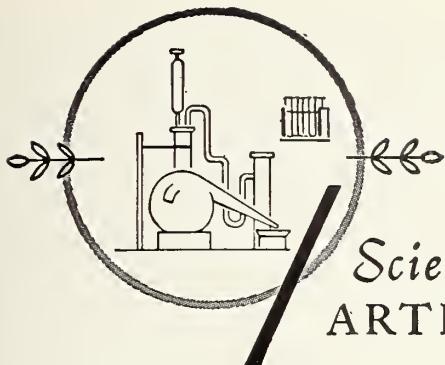
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Scientific ARTICLES

Current Concepts

Clinical Diagnosis and Treatment of Fat Embolism

LEONARD F. PELTIER, M.D., Tucson, Arizona

IT USED TO BE quite easy to talk about fat embolism. There was not a great deal to talk about. Fat embolism was first described clinically in 1873, by Ernest von Bergman, so it has been around as a clinical phenomenon for a long time. Research in this area has not been very productive until relatively recently and, as we will see, the major breakthrough in our understanding of the clinical problems in fat embolism was made as late as 1964. Basically, fat embolism is a pulmonary complication of injury to bone and to soft tissue.

Anatomically, fat embolism is a condition in which fat appears in the blood, not in a fine emulsion but in droplets large enough to occlude capillaries and arterioles. These fat droplets arise from the ruptured fat cells at the local site of injury; they enter the vascular system by the process of intravasation. Intravasation is the opposite of extravasation. These fat droplets circulate in the blood and are carried to the lungs, thus becoming pulmonary emboli. The major portion of intravasated fat ends up in the lung, and the problem of peripheral embolism is a very minor one. These processes of intravasation and embolism begin immediately after injury and continue for several days. The amount of fat reaching the circulation and the severity of the embolic process is influenced by the management of the patient from the time of his injury. It is decreased by proper splinting,

by careful handling, and smooth transport of the patient.

Physiologically, fat embolism is an interesting process. The mechanical blockage of a portion of the pulmonary vascular bed by the embolic fat increases the resistance to blood flow, and it increases the pressure in the pulmonary artery, in turn, increasing the work of the right ventricle. The engorgement of the pulmonary vascular bed decreases the compliance of the lung, increases the work of breathing, and brings about a change in the ventilation-perfusion ratio. These changes begin as soon as the emboli appear in the lung, shortly after injury. Hypovolemia, or hypovolemic shock, occurring concurrently with the pulmonary embolism reduces the effectiveness of the heart's response to a demand for an increasing cardiac output. The pulmonary parenchyma produces lipase to remove the embolic fat. This is a normal exaggeration of a continuing process. As the neutral fat is hydrolyzed, a chemical pneumonitis results. There is increased permeability of the capillary and alveolar cell with leakage of the fluid and fibrin into the alveoli. The lung surfactant activity is decreased while a diffusion barrier has become established. All of these changes—the decrease in compliance, the increasing work of breathing, changes in the ventilation-perfusion ratio with a shunting of unoxygenated venous blood through the lung, the diminished functional residual capacity, and the diffusion barrier—promote poor oxygenation of venous blood resulting in arterial hypoxemia.

Pulmonary fat embolism is associated with trauma. The stress concept of fat embolism has not stood up, and although there is an increased excretion of catechol-

Professor of Orthopedics, Arizona Medical Center, College of Medicine, Tucson, Arizona 85724.

Presented at the 115th annual meeting of the Kansas Medical Society, the International Symposium on Fat Embolism, May 8, 1974, Topeka.

amines as a result of the trauma, it makes no contribution to the embolic process itself. The pulmonary fat embolism, with its mechanical and chemical changes, produces the damage to the capillary wall through edema, hemorrhage, fibrin deposition and atelectasis, and these factors then result in the phenomenon of hypoxia.

Clinically, fat embolism is a particular form of post-traumatic pulmonary insufficiency. It is seen in patients with fractures, particularly fractures of the pelvis, femur, tibia, and ribs. I always emphasize ribs, because most people with serious trauma (with multiple rib fractures) have a bone injury equal in severity to a fracture of the femur. The significance of rib fractures in patients with fat embolism is frequently overlooked. Fat embolism is more frequent in patients who are hypovolemic or who have had episodes of hypovolemic shock. It is characterized by an inapparent hypoxemia and by the classical petechial hemorrhages. Patients with fat embolism commonly exhibit a thrombocytopenia and electrocardiographic evidence of hypovolemic shock. Occasionally, the chest x-ray will show widespread changes. Most important, fat embolism is a self-limited disease which can and usually does end in complete recovery of the patient.

The clinical diagnosis of fat embolism is based on a high index of suspicion and I gather, from what I heard, that the index of suspicion is higher in Topeka than it is in most places. A history of multiple skeletal injuries, multiple fractures, and crushing injuries with damage to soft tissue is an important part of the case. The petechial hemorrhages are classical, and separate fat embolism from patients who are considered to have posttraumatic pulmonary insufficiency. These patients may have "shock lung," pulmonary contusions, or they may have aspiration pneumonia. Posttraumatic pulmonary insufficiency is used by some who are lumpers, to include a wide variety of diseases. Fat embolism is the one condition which can be separated out, on the basis of physical findings of the classical petechial hemorrhages. Tachypnea and dyspnea are often described. These are very difficult to quantitate, but they are worth paying some attention to. The disturbance of consciousness can be combativeness, confusion, delirium, coma; there is a wide range of disturbances of consciousness.

The 63 patients with fat embolism in our series had 280 fractures. The association of other types of soft tissue injury with this group again emphasizes the fact that fat embolism is a condition which is usually associated with multiple severe injuries.

The petechial hemorrhages are one of the more interesting parts of the disease, and they are seen in the axilla, on the flanks, across the chest, at the base of the neck. They are usually seen on the soft palate. They can also be found in the subconjunctivae. One of our

medical students asked why they do not occur on the back; the reason is, we do not look on the back. Most of these people are seriously injured, and one cannot see their backs very well, but if they can sit up to be examined, one would find petechiae occurring on the back as well as on the front and the sides of the patient.

These petechiae have a typical appearance. They occur within 12 to 24 hours after injury, and they may occur as late as four to five days after the injury. How many petechiae does it take to make a clinical diagnosis of fat embolism? Three or four clinical petechiae are enough. One may find literally hundreds of them. Petechiae may also be seen on the globe itself, standing out against the contrasting sclera of the eyeball. One area which the clinicians have overlooked is the importance of looking into the eye grounds of these patients. The eye ground findings in patients with fat embolism are essentially hemorrhagic. These hemorrhages may absorb, or they may remain and become the only permanent change which is seen after fat embolism when the patient recovers. For many years, this has been referred to as Purtscher's posttraumatic retinopathy, and can be used to substantiate a diagnosis of fat embolism many years later.

Dr. Sevitt¹ has a marvelous picture in his book of a fat droplet at the base of a petechial hemorrhage in a skin biopsy. I examined a number of petechiae under the microscope and, unfortunately, I was never able to find this association. I wondered why one had to have a fat droplet at the base of every petechia. It occurred to me that it does not represent a local embolic phenomenon. It might represent an increased capillary fragility and, therefore, one should be able to provoke petechia in patients who do not exhibit them spontaneously. Dr. Garner, who is presently an orthopedic surgeon in Kansas City, Missouri, and I, each took a group of injured patients and tried to provoke petechiae in them using a petechiometer and a Rumpel-Leed test. We were able to provoke petechiae in about two-thirds of the patients with serious skeletal injuries. It reinforced my concept, that this represents not an embolic phenomenon with fat droplets in the skin, but a change in the capillary fragility.

Thrombocytopenia also occurs in fat embolism: we see that the platelet count drops. It has been demonstrated that every droplet, as it becomes lodged in the lung, is coated by a layer of platelets. Experimental work going back many years demonstrates that any time foreign bodies are injected into the circulation—charcoal particles, for example—they are immediately covered by a layer of platelets. When many fat droplets are circulating in the blood, the surface area of these small droplets is tremendous, and they act as a magnet to attract platelets. This is one of the reasons for the thrombocy-

topenia seen in this condition. The coating action has been well demonstrated experimentally by platelet counts which were made in dogs who had no trauma other than the intravenous injection of oleic acid or mineral oil (triolein); they had a marked drop in the blood platelet count with the injection of these substances into the circulation. There is no question that the emboli themselves, in the absence of other physiological disturbance, are responsible for a substantial portion of thrombocytopenia.

The most challenging future area for research relates to the petechiae and to this unexpected increase in capillary permeability. This is a clinical thing which can be seen on your own wards as you manage your own patients. We had a young man with fracture of the shaft of the femur, who showed a diffuse petechial rash, and because he had fat embolism, and because we were interested in the electrocardiographic changes in fat embolism, he had an electrocardiogram. Surprisingly, as we took the suction cups across the chest, every place with a negative pressure on the skin of the chest had an explosive, immediate increase in the number of hemorrhages, thus nicely demonstrating that this is due not to the emboli in the skin itself but to the increased capillary fragility. And it is this capillary fragility that needs further investigation.

What about the head injuries and cerebral findings in patients with fat embolism? Dr. Pazell went over a large group of patients and found that what has passed for many years as cerebral fat embolism is probably a reflection of generalized hypoxemia, and the degree varied with the length of time the hypoxemia has been present. Interestingly enough, if the patient recovers, he has no demonstrable persistent neurological change, and this is a contrast with other types of head injury deficits which are so common.

Diagnosis

We have used the detection of fat in the urine, which is a cumbersome method and only useful in a research setting. We have studied elevations of serum lipase, which are consistent in this condition. Unfortunately, the elevation of the serum lipase occurs late—three or four days after injury, and gives no hope in the immediate diagnosis of such a patient. The chest x-ray is useful particularly to separate lung contusion from fat embolism. If a patient has an injury and is brought directly to the emergency room, if he has a lung contusion, it can be seen on the x-ray immediately. If he has or is going to develop fat embolism, the chest film initially will be normal, so it is always advisable to have a chest film, even though it may not be overly productive in terms of information. The electrocardiogram, however, has been extremely helpful. Of course,

great stress is put on the platelet count and the measurement of the blood gases.

We have had considerable experience with the detection of fat droplets in the circulating blood beginning in 1952, when we utilized a water soluble fat stain. There are a variety of methods which can be used to detect fat droplets in the circulating blood. They occur consistently and, unfortunately, they occur in too many patients. The fact that fat droplets can be found in the circulating blood does not indicate that this particular patient may later develop severe changes related to his fat embolism. It is useful to demonstrate that there are emboli, but it gives no prognostic value immediately as to whether the patient is going to get sick or not. And for this reason, we do not use them.

A classical chest x-ray showing diffuse atelectasis can be associated with other problems, such as aspiration pneumonia. One of the things about the chest x-ray is that there is no correlation between the degree of arterial hypoxemia and the appearance of the chest x-ray. Patients may be well oxygenated with very poor looking chest films. Also, patients may be hypoxic with what appears to be a perfectly normal x-ray.

Dr. Pazell and I,² several years ago, described 63 patients with fat embolism, and this is the breakdown of value of tests which we used. We were able to find fat in the urine of 85 per cent of the patients in whom we looked for it. Serum lipase was elevated in about two-thirds of the patients. The electrocardiogram had changes significant of heart stress and cardiohypoxemia in about 80 per cent of the patients. This was a great surprise to us, and it is one area in which an internist may be of tremendous help. The chest x-ray was only positive or characteristic in 30 per cent of the patients, and it did not turn out very well as a diagnostic test. The platelet tests were below 150,000/cu mm in about 80 per cent of the patients; the arterial blood gas measurement, which is a significant measure now, was positive in about 90 per cent of the patients.

The breakthrough which occurred in 1964, was made by a group of internists in Canada, who had a blood gas machine and measured the blood gases in patients with fat embolism. It was described as inapparent hypoxemia and, subsequently, this has been confirmed by everyone who looked into it. The level at which gas values are set varies considerably with population and altitude. We have picked 60 mm, below which, we think, there is significant pulmonary shunting related to fat embolism.

Treatment

We are getting more and more into the initial treatment of these patients rather than waiting for the severe syndrome to develop. The most useful prophylactic

measure begins with the prevention of shock, and this goes back to something orthopedists have been doing for years when they splint them "where they lie"—the proper splinting, the gentle handling, the easy transport of the patient, the avoidance of unnecessary manipulation in the emergency room and x-ray, and the general supportive care of the patient—possibly the most important prophylactic procedure which can be done. We are getting more and more interested in the early administration of oxygen to our patients with fractures, beginning with 40 per cent nasal oxygen after the patient is being worked up in the emergency room and continuing this for the next 48 hours or more, depending on the blood gases. The early administration of oxygen to such patients seems so far to relieve the later need for tracheostomy, intubation, and the use of mechanical respiratory support.

There is considerable literature on the use of corticosteroid hormones in the treatment of patients severely ill with fat embolism. We have found that this is rarely needed if the patient has been given good respiratory support, and we use it then not routinely, but only in those patients whose respiration we are unable to support adequately with a respirator. We find the indications for the use of corticosteroid hormones becoming fewer, as our prophylactic methods of management be-

come more successful.

I would like to say a few words in regard to the hemoglobin dissociation curve. When measuring arterial blood gases, one is measuring the pressure of the dissolved gas in the plasma. This does not carry a very significant amount of oxygen to the tissue. Oxygen is delivered to the tissue in combination with hemoglobin, and most of the oxygen used in the tissue is transported in combination as oxy-hemoglobin. Therefore, it is important to correct anemias in these patients with some blood loss, but we do not want these patients to become anemic, because the volume of oxygen delivered depends on the hemoglobin concentration.

Summary

Fat embolism is a controversial condition, and this is one of the reasons why it is so interesting an area in which to work. We do not know much about this condition yet, but we hope that continued research in the hospital and laboratory will lead to a better understanding of the problem.

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Laboratory Diagnosis

Cryostat Test and Fat-Particle Counting of Plasma

ANTONIO HUAMAN, M.D., Topeka

FAT EMBOLISM is a controversial disease, as we have just heard. That is essentially true when the diagnosis is based solely on a constellation of symptoms which appear after trauma, whether or not fat embolism is present. Fortunately, the clinical criteria now, in addition to clinical findings, utilize an assortment of biochemical and microscopic data that allow for a more positive and earlier diagnosis. In this new light, fat embolism need no longer be controversial, as long as its pathogenetic mechanism—fat embolization—is correctly evaluated, and as long as the clinical diagnosis is corroborated by the objectivity of direct laboratory tests.

Fat embolization is to clinical fat embolism what hemorrhage is to hypovolemic shock: both occur often but become symptomatic only in some cases. Fat emboli appear in practically every trauma, but their concentration in the blood varies during the posttraumatic period; the pathogenicity, however, depends upon the impairment of the pulmonary, cardiac, and cerebral oxygenation brought about by the large number and size of the emboli. In the best of circumstances, the emboli are small and not numerous enough to produce such damage. At any rate, the emboli are finally cleared out by the kidney.

The fat emboli are easily visualized in the tissues of accident victims, provided the tissues are stained for neutral fat; they are seen in the blood clots of relatively large vessels of the lungs, liver, and extremities. This observation moved us to successfully examine frozen sections of pre-mortem blood, with positive results. The technique was reported as the Cryostat Test.¹ Since the cryostat test was positive in a number of asymptomatic and subclinical cases, studies were undertaken to design a quantitative test which soon became publicized as the "Fat-particle counting of plasma."² It allowed us to determine the progression and regression of fat embolization during the posttraumatic period and to measure the size of the fat emboli.

Medical Director of Laboratories, St. Francis Hospital, Topeka, Kansas 66606; Assistant Clinical Professor of Pathology, University of Kansas School of Medicine, Kansas City, Kansas 66103.

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Address reprint orders to: Antonio Huaman, M.D., 105 Medical Arts Bldg., Topeka, Kansas 66604.

The demonstration of neutral fat in the urine has been a time-honored procedure in the management of fat embolism, except for the fact that the results are marred by severe technical difficulties; therefore, we have completed our investigation with a rather simple technique for the demonstration of the lipuria.

Our presentation today, since Dr. Peltier has clearly

Techniques of the cryostat test, fat-particle counting of plasma, and the demonstration of the lipuria are discussed.

reviewed the conventional laboratory tests in fat embolism, will deal only with the techniques and comments on the cryostat test, fat-particle counting of plasma, and the demonstration of the lipuria.

Cryostat Test for Fat Embolism

The circulating fat droplets in fat embolism syndrome are trapped in the blood clot during coagulation; they can be demonstrated by cryostat frozen sections of the blood clot stained by oil red. The slides are examined under ordinary light microscopy.

Procedure

1. 10 ml of venous blood is obtained from the patient and allowed to clot in a test tube in vertical position.

2. After clot retraction, cryostat frozen sections are obtained from the entire length of the clot. Sections are cut 10 μ in thickness. The cryostat should be at -20 C.

3. Sections from the cryostat are recovered on fat-free, new glass slides and allowed to dry at room temperature.

4. Slides are fixed in 70% ethyl alcohol for 15 seconds.

5. Slides are stained with 1% alcoholic solution of oil red (in 70% ethyl alcohol) for 3 minutes. (Keep the dye in refrigeration and filter before use.)

6. Slides are washed in 70% ethyl alcohol briefly.

7. Slides are washed in tap water.

8. Slides are stained with Harris' Hematoxylin for 3 minutes.

9. Slides are washed in tap water.
10. Slides are rinsed in a weak aqueous solution of ammonia (5 gtt in 100 ml).
11. Slides are mounted in glycerin gel.

Results

The positive reaction consists of bright-red fat droplets frequently surrounded by a clear space. The fat droplets vary in size from a few to about 200μ ; they may show a round or crescentic configuration, and they may be accompanied by minute fragments of stainable material. The clear space is apparently due to clot and fat retraction (*Figure 1*).

The negative reaction consists of a granular, brownish background with no stainable material.

Artifacts

Beware of the following artifacts:

1. Unwashed dye. It appears as sharply circumscribed red droplets resting on top of the section or in its margins.
2. Lint. These particles stain lightly, are flat, and are generally seen above or below the section.
3. Excessive drying. The section shows "fracture-lines" in which minute drops of stain may accumulate.

Quality Control

Quality control system with each batch of tests is desirable, as follows: a bone marrow clot is used as a positive control, and a clot from venous blood of a healthy, non-traumatized person serves as a negative control.

The investigation of fat in blood clots was attempted by Peltier and Harkness³ without success, mostly due to technical difficulties with the carbon dioxide microtome; however, with the refrigerated microtome (cryostat) in use today, blood clots can be cut into very thin sections which could be selectively stained for fat. The blood clot is easily manipulated as a tissue: it contains the fat emboli trapped during coagulation and, furthermore, the emboli are concentrated in only one-half or one-third of the original volume of the specimen.

In our original report, the sensitivity and specificity of the test were found to be adequate in the laboratory and in clinical material. The test required a rather low concentration of fat emboli to become positive and did so in 20 of the 22 typical cases of fat embolism, and in all 6 cases of subclinical patients.¹ Additional experience has confirmed its usefulness: (1) as a confirmatory test for otherwise obvious cases of fat embolism; (2) as a diagnostic test for subclinical cases which otherwise would remain ignored as to the real cause of the symptoms; and (3) as the only diagnostic test for the pulmonary fat embolism, a superacute subsyndrome which

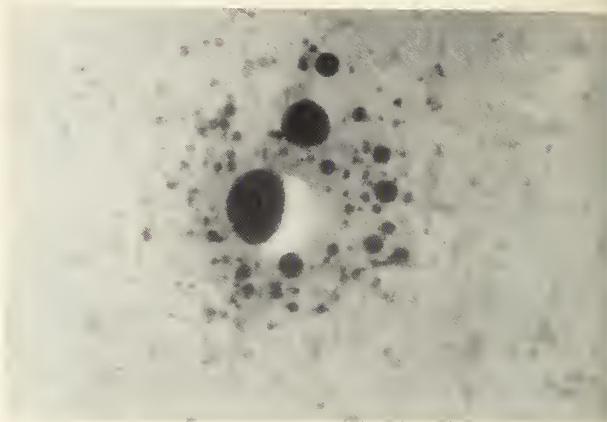


Figure 1

could be favorably modified by specific therapy. The cryostat test gives positive results as early as 30 minutes after injury, thus preceding the symptomatology of fat embolism.

Fat-Particle Counting of Plasma

Hemocytometer Counting

A. Principle: Fat emboli (fat macroglobules) are driven by centrifugation to the top of the plasma phase of an EDTA sample of blood. After separation of the plasma, the emboli are resuspended and counted in the Neubauer chamber after dilution and staining with oil red. The results are reported per 1 mm^3 of plasma.

B. Equipment:

1. Oil red alcoholic solution:
Oil red 0 1.00 gm
Acetone 50.00 ml
Ethyl alcohol 70% 50.00 ml
Filter immediately before use.

2. Neubauer chamber.

3. Hemodilution pipettes for WBC.

4. Light microscope.

C. Procedure:

1. 4.5 ml of venous blood is obtained in EDTA (Vacutainer, purple top).
2. The blood is centrifuged at 4,000 rpm for 10 minutes.
3. Plasma is separated, using disposable Pasteur pipettes; the uppermost portion of the plasma should always be included.
4. Fat particles are resuspended by hand shaking or mechanical shaking for 3 minutes.
5. In a WBC dilution pipette, resuspended plasma is drawn to mark "I," and oil red solution to mark "II."
6. Plasma is shaken energetically for at least 5 minutes.

7. Plasma is loaded into a Neubauer chamber, both sides, and the fat macroglobules are counted in the two counting areas totalling 1.8 mm^2 . $100\times$ magnification (ocular, and objective $10\times$) is used. Only particles clearly stained red are counted; do not count dot-like corpuscles or artefacts resulting from protein precipitation.
8. The number of fat particles per 1 mm^3 of plasma is calculated from the following formula:

$$\text{Fat particles per } 1 \text{ mm}^3 = \frac{N \times 10}{1.8}$$

N = Number of particles counted.

$1.8 =$ Volume of suspension counted.

9. The number of fat particles per 1 mm^3 of plasma is reported.

Counting in the Coulter Counter

- A. Principle: The fat emboli present in the plasma from an EDTA sample of blood are resuspended by shaking, diluted in Isotonic solution and counted in the Coulter counter, model F, using the same settings established for blood cell counting.

B. Equipment:

1. Coulter counter model F.
2. Diluent-dispenser (Coulter).
3. Isotonic diluent solution (Coulter).
4. Zap-Oglobin (Coulter).
5. Counting vials.

C. Procedure

1. Sample of venous blood in EDTA (Vacutainer, purple top) is obtained.
2. Blood is centrifuged at 4,000 rpm for 10 minutes.
3. Plasma is separated, using disposable Pasteur pipettes; always include the uppermost portion of the plasma.
4. Fat emboli is resuspended by hand shaking or mechanical shaking for 3 minutes.
5. A dilution 1:500 of plasma in isotonic diluent is prepared.
6. One drop of Zap-Oglobin is added and mixed; avoid getting bubbles.
7. The counter is set as it would be for counting of blood cells; count the background (B).
8. The diluted plasma is counted and the result (N) is recorded.
9. Background B is subtracted from the Count N.
10. The difference is reported. This represents the number of fat particles per 1 mm^3 of plasma.

Sizing by the Hemocytometer

The plasma is diluted, as for fat-particle counting, using 1 per cent oil red solution. The diameter of the

fat particles is measured by a micrometer placed within the ocular of the microscope. The micrometer is divided into 50 arbitrary units which have been calculated in microns for the particular segment of the lens used. Each division of the micrometer was found to be equivalent to 1.9μ at high power magnification. Only particles measuring one division or more were counted and computed as the percent of total count (*Figure 2*).

Sizing by the Channelizer II (Coulter)

The Coulter Channelizer II is a multi-channel particle-size analyzer designed to be used with the Coulter counter models DF, FN, and Z. The instrument is capable of analyzing pulse inputs from a suspension and presenting the data visually in form of a frequency distribution curve, simultaneously with counting of any or all channels. The instrument detects 100 contiguous sizes and counts the particles in each dimension. It also provides an histogram. The preparation of the counting suspension is similar to the counting with Model F. The size of the fat particles was obtained by multiplying the channel number by four.

From the laboratory viewpoint, fat macroglobules and fat emboli are countable by microscopic methods (if the particles are selectively stained) or by electromagnetic counters, provided that the interfering particles are phased out. The following are considered as interfering particles: (1) platelets which are eliminated by increasing the threshold of the instrument (as to count red cells); (2) chylomicrons, which are eliminated in the same way as platelets since both are very small particles; (3) residual red cells, which are hemolyzed. The possibility of residual leukocytes still remains, but their number is too small to be significant.

The two counting methods render comparable results, although they do not duplicate each other (*Table 1*). Visual counting by the hemocytometer can be performed in any laboratory, and offers the advantage of immediate interpretation as either normal or compatible with fat embolism, depending on the absolute number and the presence of large fat particles. Instrumental counting eliminates human errors and subjectivities, and offers simplicity and consistency suitable for prolonged moni-

TABLE I
PARTICLE COUNTING OF PLASMA
NORMAL SUBJECTS

Method	Median 1 mm^3	Limits of Variation	1 Standard Deviation
Hemocytometer	334	000-700	± 84
Coulter Counter	286	000-727	± 114

POST-TRAUMATIC CONCENTRATION OF FAT EMBOLI

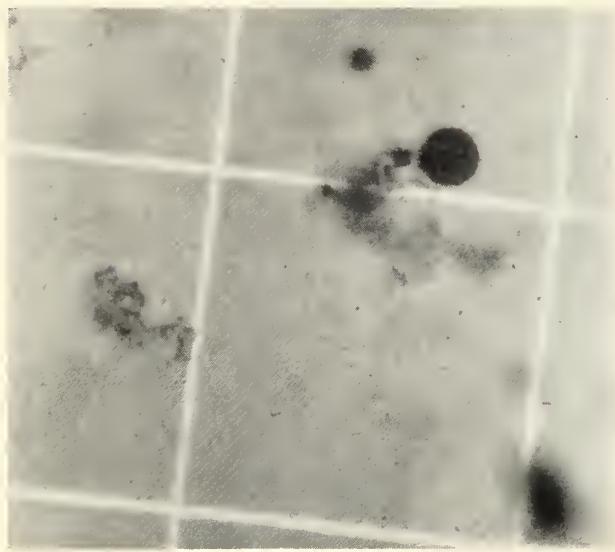
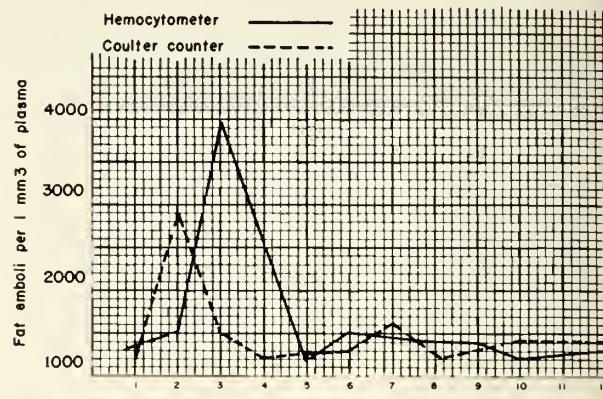


Figure 2

toring, provided that an electromagnetic counter is available.

Fat-particle counting and sizing requires interpretation of the results as long as fat particles exist in normal persons, and more so in traumatized patients.^{4, 5} The number of fat particles in plasma of normal subjects has been found to range up to 700 per 1 mm³ (*Table I*), but the number alone does not show the entire phenomenon, as does the concentration curve during the posttraumatic period (*Graph I*). The number of particles, in fact, increases after bone fractures, more so in patients with clinical fat embolism who may have counts of up to 12,000 per 1 mm³ by the 3rd day, and return to near-normal figures by the 6th day. On the other hand, treatment with alcohol tends to bring the concentration to near-basal levels sooner than untreated cases, although an immediate increase of small particles follows initiation of the treatment. This effect is apparently due to breaking up of large emboli by the emulsifying properties of alcohol, thus facilitating their release from small vessels and their elimination through glomerular filtration. Repeated counting is, therefore, more informative than sporadic counting.

Further evaluation of counting and sizing of fat particles is necessary before numerical normal values can be firmly established during each of the posttraumatic days, but the potential of particle counting has already been shown in our short series: (1) Particle counting of plasma can be a routine monitoring method of the posttraumatic lipemia; (2) a routine diagnostic tool for the early diagnosis of fat embolism; and (3) a reliable parameter to judge the efficiency of its treatment, not only in accidentally traumatized patients, but also in patients undergoing open-heart surgery⁶⁻⁸ and intramedullary nailing of long bones, regardless of its im-



Graph I

mediacy to the acute traumatic episode.

In addition to this type of case, we have diagnosed and treated fat embolism following hysterectomies and drainage of perinephric abscesses in obese patients who, interestingly enough, had fat emboli measuring up to 200 μ when measured on the slide of the cryostat test. Observations of this type, however, are uncommon since no suitable method to demonstrate and evaluate this phenomenon *in vivo* has been available.

The study of the size of fat particles demonstrated a definite difference in the size of plasmatic fat particles between normal persons and patients with fat embolism. Patients with fat embolism had much larger particles which can be demonstrated by visual measurement in the hemocytometer, or by electronic distribution counters (*Table II*).

The volume of the particles, however, has a wide range of variation; patients with fat embolism have particles of 80 to 200 μ , and there appeared to be particles that were not recorded in the machine due to mechanical limitations.

This observation corroborated the hypothesis that was previously enunciated: the size of fat particles has clin-

TABLE II
FAT-PARTICLE SIZE

Plasma	Visual (microns)	Plotter "J" (cubic microns)	Channelizer II (cubic microns)
Normal			
Diameter ..	2- 6	—	—
Volume ..	—	28-64	—
Fat Embolism			
Diameter ..	2- 6	28-44	16-36
Volume ..	14-16	124-186	80-200

cal significance in the production of fat embolism, more so than the actual number, since large particles have greater embolizing capabilities of the arteriolar and capillary circulation.

It has also been observed that treatment tends to increase the particle number and decrease the size, although these trends have not been statistically studied as yet.

Investigation of Fat in Urine

A. Specimen: Random urine.

B. Fundamentals: Neutral fat in the urine is stained by the addition of oil red and vigorous shaking, and then surfaced by vigorous centrifugation. It is subsequently demonstrated by light microscopy on the supernatant.

C. Reagents and Equipment:

Centrifuge tube.

Alcoholic oil red suspension (1% in 70% alcohol).

Slides and cover slips.

D. Procedure:

1. 15 ml urine is transferred to a centrifuge tube.
2. 5 drops of recently filtered oil red alcoholic solution are added.

3. The urine is chilled for 1 hour in the refrigerator.

4. The urine is centrifuged at 2,000 rpm for 5 minutes.

5. The very top of the supernatant is sampled with a capillary pipette or a wire loop and deposited on a fat-free microscopic slide.

6. The mixture is covered and observed.

E. Neutral fat appears as irregular masses of bright red material.

F. Normal: No fat present.

G. Quality Control: Fat-positive and fat-negative controls are run together with the unknown. A routine control is prepared by adding liquified bone marrow to normal urine.

Neutral fat in urine, lipuria, was regarded as a diagnostic test ever since Scriba (1880) reported fat droplets in patients with fat embolism. Lipuria occurs in 50 to 80 per cent of patients with bone fractures. This interpretation, however, overlooks the fact that lipuria is a feature of traumatized patients and not specifically of fat embolism. In fact, its frequency is limited only by the sensitivity of the test used. We believe that lipuria is a component of the posttraumatic syndrome and represents the pathway of elimination of the fat emboli, after emulsification either by endogenous lipase or by lipolytic treatment. Lipuria is not a specific sign, not even for trauma patients, because it also appears in nontraumatic conditions such as nephrotic syndrome, hepatic cirrhosis and, occasionally, in normal persons. Although lipuria is no longer pathognomonic, it still retains its value in

fat embolism, both as a measurable parameter of the fat embolization and as an indicator that the embolic phase of the syndrome has ended.

After this exposition of laboratory techniques, a practical summary of the laboratory handling of fat embolism is in order.

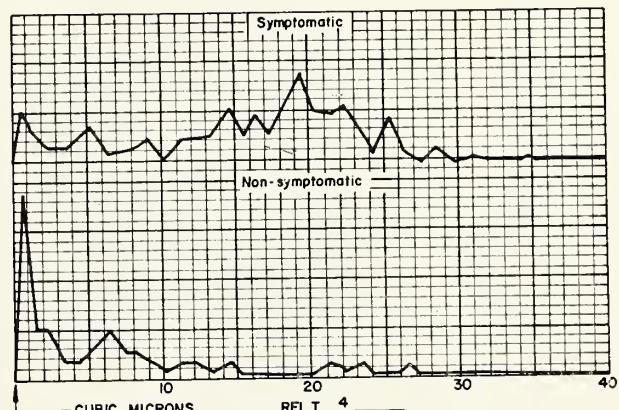
Summary

A patient prone to develop fat embolism, such as one having fractures of the femur, tibia, or ribs should be screened for large-size fat emboli. Emboli the size of blood cells do not produce fat embolization and do not alter the anatomy or function of the brain, lungs, myocardium, or kidneys; those that measure between 20 to 40 μ , however, can still pass through capillaries but are frequently seen in fat embolism and, therefore, have some diagnostic importance. Fat emboli of 40 μ or larger frequently produce emboli and microinfarctions which result in both anatomic and functional disturbances of the above-mentioned organs; their presence in the blood is diagnostic for fat embolism. The screening is successfully accomplished by the following methods.

1. The cryostat test, which is only positive to large emboli, large enough to be trapped in the blood clot (at least 20 μ in diameter. Emboli measuring 200 μ are frequent.).

2. Sizing by the hemocytometer, in which a good approximation of the diameter can be taken by comparison of the embolus with the markings of the Neubauer chamber (smaller divisions of the red-cell counting area measure $40 \times 40 \mu$). For those in the laboratory, always report the maximal diameter observed; and for those in clinical medicine, remember that fat emboli 40 μ and larger should be considered diagnostic for impending or symptomatic fat embolism. The hemocytometer technique has the advantage in that it can be performed by

POST-TRAUMATIC FAT EMBOLIZATION



Graph II

any average laboratory worker, and the expertise of a cryostat technician or the pathologist is not necessary.

3. Histograms obtained by the Channelyzer II method suitable for sophisticated laboratory. The histograms of fat embolism are rather characteristic (*Graph II*).

At the present stage of our studies, we do not place great diagnostic emphasis on a single particle counting, but we consider that the serial counting brings about the confirmation of the diagnosis and the progress of the fat embolization, whether specific treatment has been given or not.

Finally, it should be pointed out that the areas of investigation in fat embolism, as far as laboratory medicine is concerned, will have to be on the evaluation of fat embolization in the different types of operations daily performed in our hospitals, particularly open-heart surgery and joint replacements, in the prevention of the clinical syndrome on traumatic or surgical patients, and perhaps the assessment of fat embolization in sports, if it occurs at all.

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Fat Embolism

Pathology of Fat Embolism and Its Significance

SIMON SEVITT, M.D., F.R.C.P.I., *Birmingham, England*

FAT EMBOLISM is best defined in morphological terms if confusion is to be avoided. It is the blockage of blood vessels by fat globules too large to pass along fine capillaries. The emphasis is on blockage which separates the embolism from lipemia, in which much of the plasma fat is a fine emulsion readily passing along the smallest capillaries. The condition is a multiple micro-embolism affecting numerous small vessels, especially capillaries. Most emboli are between 10 and 40 microns in diameter, though the larger ones are found only in the lungs. Fat emboli are fluid and deformable; they can penetrate capillaries and hence occlusion is often temporary or incomplete or both. This aspect is of great importance in understanding the effects of the emboli on tissues.

Assessed histologically, a significant degree of fat embolism is rare except as a complication of trauma, particularly fractures. However, minor degrees of pulmonary fat embolism may be found at necropsy in a variety of conditions, including some subjects dying of natural causes; then it is trivial and incidental, and has no bearing on the patient's illness or death. The origin of these emboli is uncertain but liver fat is a possibility.

The present account is necessarily restricted and for more detailed treatment the reader is referred to other writings.^{1, 2}

Origin of the Emboli After Injury

The classical view of genesis dates from the 19th century: the fat originates at the site of trauma and, especially, from the injured marrow of fractured bones. Fat cells are ruptured and the freed globules gain access to the circulation through small ruptured veins. The work of Young and Griffiths indicates that this can occur within the damaged marrow as a result of a local shift in the differential between extravascular and intravenous pressures. With changes of pressure, even momentarily, the same torn veins may bleed at one moment and then draw inert particles within the lumen (*Figure 1*). So the globules become emboli and reach the pulmonary artery and the lungs. Emboli enter the lungs within minutes or even seconds of the fracture, and lung embolism prob-

ably continues for some hours, or a day or two, with the amount of fat in the lungs increasing during this time. After the initial abrupt phase, the entrance of new emboli into the circulation is probably intermittent, depending on the mobility and treatment of the fractures, manipulation, operation, and other local factors. This is consistent with the recurrent episodes of subclinical hypoxemia, which have been found following fracture manipulation and surgery.

Another view of origin asserts that the emboli are derived from the emulsion of fat in the plasma or from general depot stores. The emboli are said to form within the bloodstream under systemic conditions promoting intravascular hypercoagulability, the process perhaps being triggered off by the entry of a little fat from the injured area. The evidence in favor of a marrow origin is substantial: it includes the high frequency of lung embolism by both bone marrow fragments and fat globules in those who succumb within hours of fractures, the close necropsy relationship between large numbers of lung emboli, and the multiplicity or severity of fractures. On the other hand, the absence or scarcity of fat emboli in patients without fractures, as well as in those subjected to severe stress, hypercoagulability, extensive burns, or gross hemorrhage is also a fact. Furthermore, experimental observations in dogs revealed that the fat

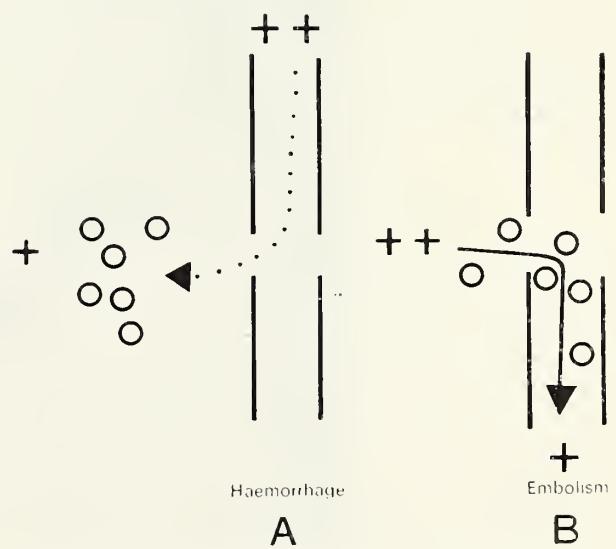


Figure 1. Mode of entry of fat globules into torn veins in damaged bone marrow.

Consultant Pathologist, Birmingham Accident Hospital and Rehabilitation Centre, Birmingham 15, England.

Presented at the 115th annual meeting of the Kansas Medical Society, the International Symposium on Fat Embolism, May 8, 1974, Topeka.

washed from the lung vessels after femoral fractures had the chemical composition of marrow fat, not that of blood fat.

There is no satisfactory evidence that fat emboli after trauma are derived from a source other than the site of injury, particularly the marrow fat of fractured bones. Direct venous entry is the main, probably the sole means of access to the blood stream.

Pulmonary Fat Embolism

The pulmonary embolism may occur by itself or in association with systemic fat embolism. Fat embolism in the lungs is very common, possibly universal after fractures, and is often histologically impressive at necropsy. Many lung emboli are between 20 and 40 microns in diameter, though sometimes smaller ones are numerous. They are seen as globules in arterioles and larger vessels, and as compressed oval or sausage-shaped bodies in alveolar capillaries or broken up into smaller globules (*Figure 2*). Hundreds or thousands of emboli per square centimeter of section are present in heavily embolized lungs. The sausage shape is due to deformation after penetration into narrow alveolar capillaries, too narrow to admit them as spheres. Some emboli are liberated into alveolar spaces, and this is the source of emboli found in sputum. In paraffin sections the emboli are manifest only as dissolved-out spaces.

The lesions produced by lung emboli are not easy to assess or interpret. Small foci of intra-alveolar hemorrhage and proteinaceous edema are quite frequently associated, but they are also not infrequent in patients dying with fractures or other injury with few or even

no lung emboli. The lung changes are less inconstant in subjects dying with a combination of considerable pulmonary fat embolism and many emboli in the systemic (including cerebral) microcirculation. Then lung weight is increased considerably in many cases, edema is the rule, and parts of the lung may be hemorrhagic. These changes seem mechanical in origin following intravascular obstruction. Secondary inflammatory changes may also be found. In a minority of subjects the lungs become heavy, dark-red, and solid from a considerable hemorrhagic edema, the latter involving alveolar sacs and interstitial tissue. This appearance in man and a similar state produced in rabbits, by intravenous injection of a small amount of hydrolysed fat or fatty acids, is the basis of the theory that the lung emboli may have exerted a chemical-toxic action, due to local liberation of free fatty acids from the triglycerides of the emboli. A modification of this view, as proposed by Peltier, is that there is an early mechanical phase of action of the emboli followed by a chemical inflammatory phase, the latter due to the liberation of fatty acids through pulmonary lipase activity on emboli. Merit in the chemical-toxic theory is likely to be confined to an action on the lungs, because any lesions in systemic organs are essentially non-inflammatory (*vide infra*). The concept of chemical action has not been substantiated or refuted as yet, and is still *sub judice*.

Experimental lung embolism following the intravenous injection of depot fat, triolein, or vegetable oils has so far been of limited value. Collins and Caldwell showed that the smallest intravenous dose which produces hypoxemia in rabbits was 0.2 ml/kg; but in our experience



Figure 2. Fat emboli (black) in alveolar capillaries. Frozen section of lung, oil red O.

this dose produced an enormous degree of lung embolism, rarely if ever seen in man. Moreover, multiple peripherally-located hemorrhagic-edematous lesions are found, at least some of which are infarcts or semi-infarcts, and these are associated with a local holdup of enormous numbers of emboli. These lesions differ from the widespread small focal hemorrhage and edema which, in man, characterize the majority of lungs with many fat emboli. Further, triolein injection can be associated with tiny foci of necrotizing vasculitis in the lung and subsequent minute granulomas, features not seen in human lungs with fat emboli. These may result from contaminating oleic acids.

Our studies in Birmingham indicate that lung pathology is often complex. Sometimes the gross hemorrhagic edema is associated with bacterial pneumonia. Further, in some subjects, the lungs show a well-defined hyaline-membrane or proliferative form of aseptic pneumonitis, attributable to the toxic effects of high concentrations of oxygen given therapeutically for hypoxia. Consequently, the lung pathology of fat embolism requires further study in man and reevaluation experimentally, to help decide the mechanism of the hemorrhagic lung edema, including whether chemical irritation from lipolytic products of emboli can be accepted as its cause.

Subclinical Hypoxemia

One of the major paradoxes of fat embolism is the low frequency of early respiratory symptoms in patients with fractures and the high frequency of lung embolism seen histologically. This conflict has been partly resolved by the demonstration in recent years of a frequent early subclinical hypoxemia in fracture patients, especially those with fractures of the tibia, femoral shaft, and pelvis (*Figure 3*). Most of the affected subjects are already hypoxic on admission to hospital (within one-half hour of fracture); the arterial PO₂ often falls to 60 or 70 mm Hg, and the episode usually lasts two or three days. It may last longer with manipulation or surgery, or return for a while. The hypoxemia is not associated with CO₂ retention, and it is subclinical because the arterial oxy-Hb saturation is not significantly lowered at these levels of PO₂. This inapparent hypoxemia was found in 60 per cent of 50 fracture-patients studied in Birmingham.

The time relations of the episode are consistent with the rapidity with which emboli accumulate in lung vessels and the period of their maximum appearance. Pulmonary fat embolism is the most likely candidate, though it cannot be assumed to be entirely responsible for the hypoxemia in all cases. Pulmonary microthromboemboli which are common in injured subjects, and other factors, may contribute. Granting that fat embolism is

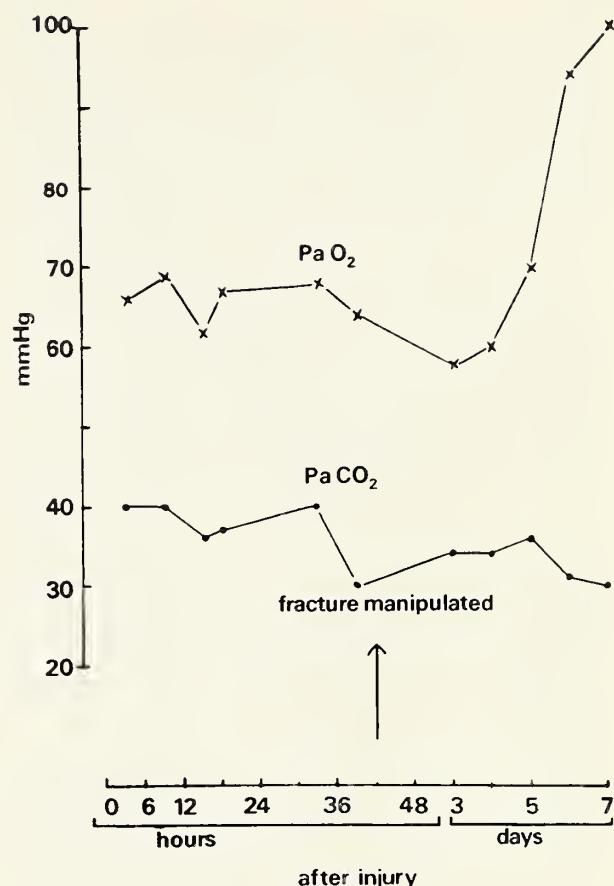


Figure 3. Subclinical hypoxemia in a patient with a fractured tibia.

mainly responsible, it remains to be explained why the embolism does not produce hypoxemia in other fracture cases of seemingly equal severity. Since the hypoxemia probably results from a degree of veno-arterial admixture related to small foci of alveolar hemorrhage and edema secondary to the embolism, variations in their degree and extent may account for the differences. However, this needs to be substantiated.

Hypoxemia in Clinical Fat Embolism

Patients with clinical evidence of fat embolism often combine serious hypoxemia (PO₂ below 50 mm Hg) with features of disseminated embolic blockage in the brain, skin, and other systemic tissues. The combination is important, and it is among the minority with both pulmonary and systemic fat embolism that clinical effects generally arise. The hypoxemia results from an increased pulmonary veno-arterial admixture, and cardiorespiratory studies indicate that the admixture of venous blood in clinical fat embolism cases corresponds to between 20 and 50 per cent of the cardiac output. There is also a factor, may contribute. Granting that fat embolism is

about 50 per cent of the total tidal volume. Perfusion disturbances through arteriolar and alveolar capillary blockage by emboli can account for the increased alveolar dead space (ventilated but underperfused alveoli) but not for hypoxemia. The mixing of venous and arterial blood in the lungs responsible for the hypoxemia must be due to other causes. Three are theoretically possible: (1) Extensive alveolar consolidation by hemorrhage or edema producing non-ventilated but perfused alveoli; (2) Considerable precapillary shunting of blood from the pulmonary to the systemic circulation; and (3) Multiple foci of dilated alveolar capillaries permitting a local acceleration of blood flow beyond the capacity of full oxygenation of the speeding red cells. The balance between these explanations needs further study, but the frequent coexistence of hypoxemia and systemic passage of emboli supports the second and third possibilities. Precapillary shunting would permit both veno-arterial admixture and enhanced passage of emboli, while dilated alveolar capillaries could have a similar effect. Alveolar consolidation by itself would not increase the passage of emboli to the aorta, though it would worsen the hypoxemia.

A concept of two possibilities relating to the lung passage of emboli is outlined in *Figure 4*. In *A*, a minority of subjects, clinical effects of embolism especially hypoxemia and cerebral (systemic) embolism develop, while these are absent in *B*. *Figure 6B* indicates the sole course of emboli when there are no clinical effects. Both *A* and *B* are suggested pathways when clinical effects ensue. The thin lines in *A* indicate that a proportion of the blood and of the emboli reaching the lungs pass into the systemic circulation via pre-capillary (pulmonary-bronchial anastomoses), though very rapid flow through foci of excessively dilated alveolar capillaries might produce the same effect.

Passage of Emboli Through the Lungs

The dynamics of the passage of emboli through the lungs are of great importance. They contain the seeds of understanding which may lead to progress in a number of directions, including the possibility of preventing or reducing the clinical effects of embolism. Unfortunately, little is known of the pulmonary factors concerned. Utilizing a model of tubes to mimic the lung circulation and water flowing at constant pressure, Gee found that when oil was injected into the system, most of the smallest tubes (capillaries) became blocked, but enough remained open to allow a free flow of water, and oil did not pass through the tubes. When larger patent tubes were clamped, oil was expelled en masse from many blocked tubes, thereby reestablishing a flow of water. If the clamping is regarded as a local vasoconstriction, the

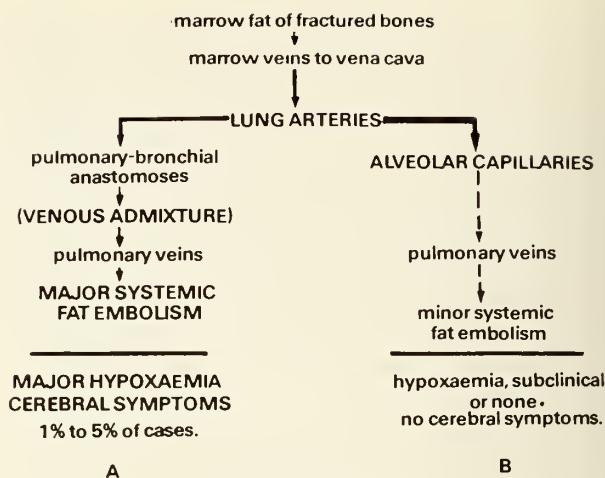


Figure 4. Hypothesis relating pulmonary fat embolism after fractures to the presence (A) or absence (B) of the clinical syndrome.

movement of oil elsewhere might be regarded as the simulation of a shunting process.

The factors which may predispose to an enhanced passage of emboli through the lungs have been discussed elsewhere.² They include large numbers of lung emboli, limitations of the filtering capacity of the lungs, a phase of shock, a rise of pulmonary artery pressure, pulmonary vasoconstriction, hypoxia, and possibly preexisting pulmonary disease. Not all may be essential in individual cases. It is postulated that under conditions of downstream pulmonary blockage by many emboli and in the face of continuing embolism, the interrelationship between the various features may precipitate lung shunting or focal dilatation of alveolar capillaries, thereby promoting the onset of a vicious circle which favors both systemic passage and hypoxemia through venoarterial admixture. The experimental demonstration by Molenaar and by Szabo and colleagues following the intravenous injection of fat, that the breathing of oxygen reduces pulmonary hypertension, hypoxemia, systemic embolism and mortality, is of considerable theoretical importance. It points to the breaking of the vicious circle promoting hypoxemia and lung passage of emboli. It also suggests the possible virtue of early oxygen administration in suitable subjects with fractures as a prophylactic measure in preventing the onset of clinical fat embolism.

Systemic Fat Embolism

Lung emboli are the immediate source of those reaching the systemic circulation. Having reached the aorta, the distribution of emboli between organs depends on the distribution of the cardiac output then prevailing, and within organs in anatomical peculiarities of blood

supply. Every organ and tissue is affected; but the considerable blood supply to the brain and kidney explains why so many emboli are found in these organs, and the main portal system of supply to the liver and anterior pituitary gland explains why they are relatively spared. The frequency of systemic involvement as judged histologically at necropsy is related to the histological degree of pulmonary fat embolism, and hence to the severity and multiplicity of fractures, with certain exceptions.

Embolii break up into smaller globules as they penetrate capillaries. This occurs initially in the lung and explains why emboli in the kidney and brain, for example, are generally smaller than those in the lungs. After a temporary hold-up in systemic capillaries, the emboli pass into veins and return to the lung. The cycle is repeated again and again, and thereby the globules become smaller and smaller until they are no longer embolic. When they approach lipomicron size, they are readily removed from the blood by phagocytic system in the liver and elsewhere.

Mode of Action of Systemic Emboli

Any pathological effects which occur are due to temporary occlusion of small vessels by liquid deformable emboli. The small size of the emboli, the extent of small-vessel anastomoses, and the inherent resistance or susceptibility to short periods of ischemic hypoxia determine the presence or absence of lesions. Therefore, the brain is most susceptible to micro-infarcts and anoxia

followed by myocardium, while the organs with more anastomosis, such as the skin and lungs, do not suffer micro-infarctions to the same extent. The absence of inflammation and toxic necrotizing effects on endothelium is against a chemical-toxic action of emboli in the brain, myocardium, kidneys, and other systemic organs.

Pathology of Systemic Embolism

Embolii produce no histological changes in most organs apart from the possibility of a few petechiae from capillary rupture. Petechiae may develop in the skin, mucous membranes, eye, heart, brain, and less often elsewhere. Foci of degeneration may appear in the myocardium and focal necroses in the brain. The brain is the most important organ affected.

The Brain

Characteristically, there is a widespread petechial eruption in the white matter of the cerebral and cerebellar hemispheres, and scattered petechiae in white matter in the mid- and hind-brain and spinal cord (*Figure 5*). The gray matter is usually spared macroscopically. However, it is important for the pathologist to recognize that petechiae can be few or even entirely absent in brain with many fat emboli, especially when survival is short. In the right clinical and pathological setting, petechiae in the brain are indicative of fat embolism but they are not diagnostic, since other causes like cerebral trauma may be responsible. Conversely, the absence of petechiae does



Figure 5. Gross petechial eruption from fat embolism in the white matter of the cerebrum.

not indicate an absence of cerebral fat embolism. Frozen brain sections are used to decide the diagnosis of whether or not petechiae are present.

Histology

The important microscopic features are: (1) fat emboli; (2) ball and ring hemorrhagic micro-infarcts related to emboli; and (3) ischemic foci of degeneration or necrosis.

The diagnostic feature is embolic intravascular fat in the lumen of minute vessels of the brain (*Figure 6*). Emboli are widely distributed throughout the whole of the central nervous system, the gray and white matter peripherally and centrally, as well as the choroid plexuses. They are most numerous in gray matter and less numerous in white matter, the opposite of lesions (*vide infra*). Density of emboli varies considerably; they may be relatively few or numerous, though rarely as numerous as emboli in the lungs.

Hemorrhagic lesions consist of ball, ring, and perivascular hemorrhages. Ring hemorrhages are round or oval in cross section, and show a zone of extravasated red cells around a focus of degenerate or necrotic brain substance. They often contain a central arteriole within which a fat embolus may be visible. They are clearly hemorrhagic micro-infarcts. Infiltration by a few leukocytes and microglial cells containing iron pigment is found in lesions older than two or three days, and flecks of fibrin may also be present centrally. Recent lesions show no evidence of inflammation.

Ischemic lesions are invisible to the naked eye. In conventional preparations they appear as rarefied, vacuo-

lated foci in white matter, the so-called *status spongiosus*. They range in size from 50 micra to 1 or 2 mm in diameter, the larger lesions representing fusion of smaller ones. They may be outnumbered by hemorrhagic foci, but sometimes they are dominant and occasionally are the only lesions found. Ischemic lesions usually predominate in peripheral white matter, but they may also involve gray matter and occasionally large numbers of tiny pale lesions are present in the cortex. Structurally, ischemic lesions range from foci of total necrosis to ones of partial demyelination without necrosis. Some are obviously irreversible but others may be partly reversible. Differences in viability are probably explained by variations in the duration or completeness of embolic vascular lodgment and consequent local ischemia.

Tissue lesions predominate in white matter, whereas fat emboli predominate in gray matter. Dominance of emboli in gray matter is due to its rich capillary bed and the relative scarcity of lesions to its numerous capillary anastomoses, even though gray matter is particularly sensitive to anoxia. The susceptibility of the white matter to lesions, in spite of the lesser number of emboli it receives, is related to fewer capillary anastomoses.

Little is known of the final outcome of the cerebral lesions of fat embolism. Histological studies in survivors of clinical fat embolism who died months or years later from other causes have shown old demyelination in the cerebral white matter infiltrated by microglia and other cells, some laden with hemosiderin and undergoing gliosis.

Cerebral embolism can undoubtedly produce symptoms and cause death probably through involvement of



Figure 6. Fat emboli (black) in the cerebral cortex. Some are elongated and distorted.

the brainstem. It has been suggested that brain lesions and symptoms are due to generalized hypoxemia. This is not so, because delirium, and especially coma, are rarely influenced by breathing oxygen, and the multifocal disseminated brain lesions of fat embolism are unlike those due to cerebral hypoxia. Histologically, they are related to embolic blockage and have been reproduced experimentally by injection of fat. On the other hand, the mental state of some subjects with clinical embolism is improved by oxygen therapy, which suggests that hypoxemia may worsen cerebral ischemic hypoxia from embolic blockage.

The Heart

Generally, the heart shows no gross change, though occasionally multiple small hemorrhages are seen in epicardium, under the endocardium, and in the myocardium.

In frozen sections, fat emboli are found in the network of capillaries between muscle fibers and elsewhere. Usually, they are relatively few, but they can be quite numerous in subjects with heavy systemic embolism. The characteristic lesions are microscopic foci of fatty degeneration of muscle fibers around embolic fat droplets. The affected sarcoplasm is packed with many minute fatty droplets which tend to obscure transverse striations. The fatty change is due to anoxic degeneration, ischemic in origin due to embolic occlusion. It occurs because heart muscle is sensitive to a reduction in its blood supply, but less so than the brain. The lesions are not infarcts and they are reversible.

The Kidney

Macroscopically, there is little of note. The dominant microscopic feature is the presence of fat emboli congregated in glomerular capillaries. Emboli may also be seen in peritubular capillaries, but they are relatively few. Occasionally, the great majority of glomeruli contain many emboli, while in slight embolism only a small minority contain emboli (1 or 2 per affected glomerulus). In between these extremes are the majority of cases. Neither necrosis of nor inflammatory changes are present even when emboli are very numerous.

The degree of renal embolism is a good index of systemic embolism, and in most subjects is closely related to the degree of cerebral embolism. There are, however, exceptions to this general rule. For example, a relatively minor renal embolism with considerable numbers of brain emboli may be due to renal vasoconstriction following hemorrhage. Nevertheless, renal blood flow is so large that its reduction to even a fraction of normal rarely prevents emboli reaching the glomeruli.

A few glomeruli may contain fibrin-thrombi, but the

association with glomerular fat embolism is not necessarily causal.

Renal fat embolism is occasionally associated with posttraumatic renal failure or tubular necrosis or both, but this association is not causal. There is no evidence that fat embolism produces renal insufficiency or tubular necrosis.

Skin

Some cases develop a petechial rash mainly over the shoulders and front of the chest and neck. Biopsies of affected skin demonstrate fat emboli in dermal capillaries, especially the superficial capillary plexus, often located near local extravasations of red cells.

The following procedure is recommended to overcome false negative results from technical difficulties. Blocks of skin about 0.5×2 cm containing petechiae are excised, pinned on a piece of corkboard, and fixed overnight in formol-saline. Subdermal and subcutaneous adipose tissue is then closely removed from the dermis to reduce artefacts. The block of skin is trimmed to expose petechiae along one edge, and is embedded in gelatin. About a dozen sections are cut at 15 microns and stained with oil red O. Several sections are usually required to demonstrate unequivocal embolic fat, and emboli are seen best in the superficial dermal capillary plexus.

It has been suggested that the petechial skin rash is related to acute thrombocytopenia induced by fat embolism, and not to embolic blockage of skin vessels. The blood platelet count falls after experimental injection of tissue fat (due to coagulative effects of the associated thromboplastin), but it also falls in severely injured and burned subjects who have no evidence of fat embolism and no skin petechiae. Thus, a direct cause and effect relationship is unlikely. Nevertheless, thrombocytopenia may favor the appearance of petechiae when there is embolic blockage of skin vessels.

Pituitary Gland

There are always far more emboli in the posterior than the anterior lobes; the density is often greater than in the cerebral gray matter, and more or less parallels that found in the kidney. Lesions are absent, apart from a few petechial hemorrhages. The large number of emboli in the pars posterior is an index of its considerable blood supply.

A few cases of disturbed posterior pituitary function, especially diabetes insipidus, have been reported in patients with clinical fat embolism. The condition is infrequent and temporary.

(Continued on page 316)

Alcohol in Fat Embolism

Use of Alcohol by Intermittent Positive Pressure Breathing

G. WILLIAM NICE, M.D., Topeka

ALCOHOL USE both by oral and by intravenous routes has been well known both in research and as treatment of fat embolism since 1933.^{1, 2} Many statements both pro and con have since been recorded.³ However, the use of alcohol by intermittent positive pressure breathing (IPPB) has not been well documented, and deserves explanation.

The more familiar physiological actions of alcohol are:

1. Inhibition of lipase, thus decreasing the amount of enzyme available for hydrolysis of neutral fats to toxic fatty acids.

2. Speeding up of replacement of surfactant in the injured lung.⁴ Surfactant's life is apparently a few hours,⁵ and replacement is necessary for normal gas exchange.

3. Reduction in surface tension in pulmonary edema, causing the bubbles in the bronchi and bronchioles to burst, thereby allowing oxygen to enter more easily. Ethyl alcohol may be given by nebulizer, but clinically it is much more effective if given by IPPB. The 70 per cent ethyl alcohol produces a somewhat faster decrease in pulmonary edema, but because of its irritating and explosive nature, 30 per cent ethyl alcohol is preferred.

4. Dilation of blood vessels from flush to shock level.⁶ This is probably due to central vasomotor depression.

5. Cooling by evaporation.⁷

6. Irritant.⁷ In concentrations of over 40 per cent, it is especially irritating to mucous membranes of the respiratory tract.

7. Astringent.⁷

8. Solvent.

9. Denatures protein by dehydration and precipitation (germicidal).

10. Increases saliva and gastric juice;⁷ produces salivation from mild local irritation; the gastric secretion in the distal stomach and duodenum is probably a psychic effect.

11. Concentrations of alcohol above 15 per cent inhibit motility and secretions of the stomach and are irritating to the mucosa.⁷ The emetic effect is the same

Presented at the 115th annual meeting of the Kansas Medical Society, the International Symposium on Fat Embolism, May 8, 1974, Topeka.

Address reprint requests to: William Nice, M.D., 112 Medical Arts Bldg., Topeka, Kansas 66604.

in IV alcohol (120 mg/100 cc), which indicates that the emetic action is probably due to the effect of the central nervous system (CNS).

12. One or two ounces of whiskey will usually produce a rise in blood pressure, a slight acceleration of pulse rate, and a small increase in cardiac output. Much larger doses have the opposite effect.

Results of treatment of posttraumatic fat embolism and a case of amniotic fat embolism by use of intermittent positive pressure breathing with 30 per cent ethyl alcohol are presented.

13. Increases urine output, which is usually a result of CNS depression.⁶ Alcohol inhibits release of anti-diuretic hormone (ADH) of the pituitary.

14. Alcohol in moderate doses is not harmful to the function of a normal or even a diseased kidney, except possibly for the arteriosclerotic kidney.

15. A marked reduction of liver glycogen and an increase in liver fat. This is associated with a pronounced inhibition of gluconeogenesis.

16. Depresses the nervous system, beginning with the higher functions and later extending to more vegetative mechanisms. Respiration may be increased at first, then depressed. Vision may be impaired, then euphoria, muscular incoordination, and removal of inhibitions follow.

The effect of alcohol is dependent on many factors, including blood level, difference in personal alcohol use, and effect in different tissues. The distribution is controlled by: (1) High diffusibility—due to the low molecular weight (one-fourth that of glucose) it passes rapidly through body membranes; (2) Complete solubility in water—its distribution in the body parallels the water content of each tissue or fluid. Due to the high diffusibility, the blood alcohol to alveolar air constant is 2,100:1. Therefore, alcohol given by IPPB is rapidly absorbed into the bloodstream.

There are certain solutions that are compatible or incompatible when given with alcohol.¹¹ Compatible solutions include: dextrose, invert sugar, sodium chloride injections, and protein hydrolysate. Among incompatible

solutions are: lactated Ringer's injection, plasmanate, and Ringer's injection.

Certain drugs may produce a potentially lethal reaction when given with alcohol. Some of these are: barbiturates, carbamazepine (Tegretol), chloral hydrate, disulfiram and other acetaldehyde-dehydrogenase inhibitors (Antabuse, Diabenese), insulin, meprobamate, methotrexate, morphine and narcotic analgesics, muscle relaxants, nitrates and nitrites, sedatives and hypnotics, tricyclic antidepressants and Flagyl (metronidazole).

Small amounts of alcohol may cause severe pain in 15 per cent of patients with Hodgkin's disease, so alcohol should be used with caution in patients with this condition.

Several laboratory tests are altered by alcohol. A few of the more common ones are: amylase (high), uric acid (high), liver function tests, blood glucose (high or low), serum magnesium (usually low), BUN, creatinine, electrolytes, blood gases, electrocardiogram, and porphyrins (high). Therefore, it is better to check twice before treating "diseases" which are laboratory artifacts caused by alcohol.

Before entering into the methods of alcohol administration in fat embolism, I would like to review some concepts on which we base our therapeutic approach.

Fat embolism occurs with fractures of long bones,^{8, 9} injuries without fracture, fatty liver, alcoholism, burns, pneumonia, diabetes, osteomyelitis, blood transfusions, gas bacillus infections, eclampsia, postpartum amniotic embolism, cardiac resuscitation, poisoning, surgery, cardiopulmonary bypass, as well as with renal homotransplantation.

There are two clinical phases of fat embolism: (1) Mechanical—manifested by acute cardiopulmonary signs, air hunger, fever, tachycardia, cyanosis, acute right heart strain, and cardiac arrhythmia; (2) Chemical—producing diffuse CNS symptoms, restlessness, drowsiness, and confusion.

These manifestations usually develop from a few minutes to four or five days, and are frequently accompanied by petechiae, Purtscher's sign, and renal dysfunction.

The laboratory data include a positive cryostat test, decreased hemoglobin and platelet count, increased serum lipase, the arterial PO₂ usually below 60 mm Hg. The chest x-ray may reveal infiltrate in one or both lungs; the lung scan may indicate diminished perfusion; a skin biopsy or needle biopsy of the kidney may demonstrate fat embolism; the EKG may show arrhythmia or right heart strain; the EEG may reveal diffuse dysrhythmia over the entire brain.

The diagnosis of fat embolism may be summarized by using the following chart:

Trauma with no fracture 1

Trauma with fracture	2
Fever	1
Tachycardia	1
Tachypnea	1
Petechiae	2
Cyanosis	2
Purtscher's sign in eye	4
Positive frozen section of blood	4
Drop in hemoglobin	2
Arterial PO ₂ below 60 with no fracture	2
Arterial PO ₂ below 60 with fracture	4
Drop in platelets	1
Fat in urine	2
Fat in sputum	1
Chest x-ray or lung scan diagnostic of fat embolism	3
12 points	Suggestive
16 points	Probable
20 points	Diagnostic until proven otherwise

It may be helpful to consider the "6 Ts" and "6 Ps." The "6 Ts"—THINK of fat embolism—are:

1. Trauma.
2. Temperature elevation.
3. Tachycardia.
4. Tachypnea.
5. Thought disorder.
6. Tailspin.

The "6 Ps"—POSITIVE diagnosis of fat embolism—are:

1. Arterial PO₂ below 60.
2. Petechiae.
3. Purtscher's sign.
4. Positive blood or urine.
5. Positive chest x-ray or lung scan.
6. Pulmonary edema.

Treatment

The basic treatment in the fat embolism syndrome is to provide oxygen by: (1) maintaining an adequate airway, with tracheotomy if necessary; (2) using 100 per cent oxygen in severe cases; (3) reducing oxygen to 40 per cent as soon as possible.

Our best results have been obtained with the use of IPPB, using 20 to 30 per cent alcohol. It may be necessary to use it either continuously or for 15 minutes every two to four hours for several days. The use of steroids (100 mg Solu-Cortef or Solu-Medrol every 6 to 12 hours for four to eight days) may be life-saving in severe cases. Intravenous 5 per cent ethyl alcohol in 5 per cent glucose (1,000 to 2,000 cc per day) has been found essential in our experience. Dextran and Heparin (in sub-anticoagulant doses) have also been used by some investigators. Digitalis is necessary if congestive failure develops. Blood transfusions may be necessary; one pint of blood per major fracture should be considered. It is

important to prevent further injury by avoiding manipulation of fracture. Hypothermia has been tried. If methyl alcohol has been ingested by the patient, then ethyl alcohol should be given intravenously. The liver prefers to metabolize ethyl alcohol, therefore, methyl alcohol is excreted by the kidney.

Case Reports

Case One

A 20-year-old white cattleman was injured in a truck accident at 4:30 AM. He was brought to the hospital at 6:30 AM with multiple fractures of the maxilla, mandible, femur, tibia, fibula, left foot, and four vertebrae, as well as renal contusion. Tracheotomy was done. The results of a chest x-ray at 9:00 AM were negative. A repeat chest x-ray at 11:30 AM revealed extensive fat embolism in both lungs. Blood and urine examinations were positive for fat. He was started on IPPB, using 30 per cent alcohol for 15 minutes every two hours. Chest x-ray after two days revealed complete clearing.

Case Two

A 28-year-old white female delivered a baby at 11:00 AM, weighing 2.05 kg (4 lb 8 oz). One-half hour later, she became very short of breath. A chest x-ray revealed pneumonia in the left lung. The lung scan revealed delayed perfusion in the left lung consistent with fat embolism. The blood, urine, and sputum examinations were positive for fat. She was started on IPPB, using 30 per cent alcohol every two hours. Two days after admission, the chest x-ray revealed marked clearing. The blood examination for fat was positive for three months, and her urine examination for fat was positive for four months after she left the hospital.

Summary

In conclusion, the diagnosis of fat embolism can be made much more rapidly if it is suspected after trauma, fractures, surgery, or in the early postpartum patient. The clinical picture of tachycardia, tachypnea, pulmonary edema, fever, and petechiae should suggest the diagnosis. Positive frozen section of blood, fat in urine, drop in arterial gases, chest x-ray, and lung scan help to confirm the diagnosis. Oxygen and alcohol by intermittent posi-

tive pressure, and steroids are very beneficial. When treated with 50 to 70 per cent alcohol, some patients complained of irritation. These were treated adequately with 30 per cent alcohol with no serious side reactions. Intravenous 5 per cent ethyl alcohol in 5 per cent glucose was found to be an essential part of treatment.

Ode to Fat Embolism

When your trauma patient is breathing fast;
His temperature is high, pulse is rapid;
You know he can't last.

When he is confused and does not know where he is at;
Then he goes into a tailspin;
You'd better think fat.

When he has red spots on his chest, his PO₂ is low;
His chest x-ray reveals disease;
His lung perfusion slow.

Pulmonary edema begins, he is getting sicker;
Oxygen and steroids are handy;
But liquor is quicker!

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OUR THANKS

The effort and diligence of Dr. Antonio Huaman in collecting and preparing the papers contained in this issue are gratefully acknowledged.

The Journal of the Kansas Medical Society

The President's Message

On several occasions during the past three-four years, you have heard me say, I believe the Kansas Medical Society had been derelict in its duty to not in some manner prepare our membership for participation in legislative matters, leadership conference, and now PSRO. Something is missing between the sales manager, the salesman, and the consumer—the KMS membership at large.

Not long ago, I heard a speaker tell a story about a sales manager. This manager was complaining. He said the salesmen were lousy. He admitted he had hired the men, had trained them, but still, they did not produce as they should. He threw all the blame on his salesmen, none on himself.

Later, I heard a repeat of this same story, by another salesman: "The sales manager said his salesmen were lousy. I asked him, 'Who hired them?' He said, 'I did.' 'Who trained them?' I went on. He said 'I did.' And then, the third question, 'Who is actually lousy?'"

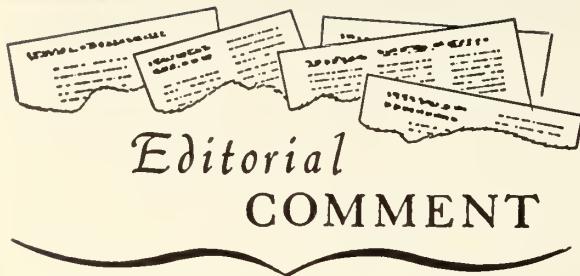
This is what happens when the doctors of Kansas are uninformed; what happens when a doctor does not know both sides of an important issue; what happens when the medical industry neglects to give the doctors an opportunity to form an intelligent opinion.

The paper appearing in this issue on page 312, prepared as a strong proponent for PSRO, is included here for that very purpose—to present the other side of the story. It proposes to do many things.

We are all in this together—one cannot believe everything one hears, but one can respect it.

A handwritten signature in cursive script, which appears to read "John Blunk".

President



Editorial COMMENT

The fire has been turned up under the political stew in anticipation of its biennial serving, and many eager cooks and waiters are offering their services toward dishing up the finished product. The diners, meanwhile, are undergoing their usual doubts and concerns as to what the stew will taste like and if it will resemble the description on the menu. They have long since learned that they will be charged for many exotic ingredients whose taste they do not relish; that whatever the flavor, the waiter's thumb will be well-immersed into the bowl; and that there will be an extra charge for crackers.

We were interested in Vale Page's report of his masochistic exercise in evaluating the status of KaMPAC. If Dr. Page's newsletter seemed to present a somewhat confused picture—and with the highest respect for that brave man, we thought it did—this seems in itself as accurate a picture as one can get of the physician trying to be a political influence.

Politics has been variously defined, and we offer no new definition, but suggest it might be compared to a social kaleidoscope, in which numerous dissimilar fragments fall into an infinite variety of random relationships transmitted to the viewer by a mirror system which presents a Rorschachian pattern with as many interpretations as there are viewers. It is a common charge that the physician individually and organized medicine collectively show a singular ineptitude for political action if, by this term, one means a concerted, united, effective action for the public good. To a great degree, this stems from the attempt to unify in a common effort a group of dissimilar, highly individualistic persons to whom the compromise essential in political life is professionally and personally foreign. Physicians are exhorted to strive for those goals which will be for their patient's welfare, but the mechanics of political action are often far removed from the patient and the effort appears to carry more concern for the physician's welfare than the patient's. Who is this patient who is to be served—whose patient is he and whose plan will serve him best?

Bed-fellows Make Strange Politics

Those who seek to marshal the political power of the medical community are faced with the fact that physicians are united (as much as they *are* united) by a common professional interest, not political identity. Some are Democrats, some are Republicans, some claim political independence, and the remainder are none of these. Their political unity is the unity of the spectrum. Thus, as the physician enters the political arena, he finds that to all intents and purposes he must abandon these platitudinous mouthings about the patient's welfare and work at the practical expression of professional welfare. And while he thinks it, he can be no more certain that the results of his efforts will be beneficial to his patient than the professional politician is that his efforts will benefit the general citizen.

The journey through the political wonderland is barely started before the physician finds he is on a toll road. It seems fair to say that the primary stimulus to political activity by physicians did not develop as some irresistible force of social concern. It developed because of money. Those hardy physicians who some time back sought to influence the direction of legislative endeavor were confronted with the rather blunt attitude: "Look, Doc, how much did you contribute to my campaign? For that matter, how much do doctors *ever* contribute?" Now, this isn't the politics one reads about in junior high civics books, but then dermatology texts don't list scratching as an essential part of the management of the itch either. After a few such rebuffs, the politically-aware physicians carried the message back home and the need for stimulating financial support for candidates was impressed upon their disgruntled colleagues—and a few who were gruntled. The solution, in this instance, was the formation of an organization, apart from the formal society structure, to promote and receive political contributions and—incidentally—examine the issues and decide how the money was to be spent.

We do not intend at this point to take on that perplexing problem of the funding of political activity. This has been occupying wiser minds than ours with-

but satisfactory solution, but the role of money as a prime mover on the political scene will not down. If the politician must rely on financial contributions (and the fantastic increase in this necessity in this electronic age is all too apparent), he incurs a certain obligation to serve the purposes of his supporters. Even if he has independent means, it simply elevates his political sights and this higher-level political effort brings the same financial needs. The contributor, on the other hand, expects something in return for his contribution, and we are confronted with the supposition that the politician will respond to the highest bidder. The fact that this happens is too well established. The fact that it doesn't happen more often is the wonder—and no small tribute to the system and to individual integrity. But whatever the social or political issues confronting us, this financial relationship is a basic feature of political physiology with prime influence on the health of society.

This realistic solution, this formation of a political action group, has, like most solutions, produced more problems. The translation of financial support from the theoretical idea to the practical accomplishment requires of those who would make it infinite wisdom, boundless energy, moral strength, total fairness, saintly patience, visionary idealism, financial acumen and cold, calculating practicality. Anyone embodying all these characteristics probably wouldn't let himself get trapped in the effort in the first place. But while this marshaling of financial support is basic, it is only the first headache for those who seek to implement the medical effort in politics. Since the funds represent a

broad range of political conviction, how can they be applied in a manner that serves all contributors equally well? If opposing candidates are given the same support, what is the net accomplishment other than being able to say to the victor, "See, we did support you," and hope he doesn't see you tearing up the "win" ticket you bought on the other horse? One still has to contend with those who helped to purchase the losing ticket and feel they were somehow cheated. Whatever the successes, there will always be some who are volubly dissatisfied and pronounce the total effort a failure.

Getting acceptable candidates into office is, then, only the first step. Issues of medical significance must be defined and an agreeable posture adopted to reflect a responsible and effective medical attitude, one that can be assured of conscientious execution if it is achieved. Ay, *there* are enough rubs for a whole castle full of Hamlets.

To us, this reflects what Dr. Page's study of KaMPAC seems to say: It will probably never receive 100 per cent support and it certainly will never achieve 100 per cent approval. It is, however, a worthy effort in a necessary direction. The alternative is to rely on each individual physician to contribute effectively in time and money to the political effort, and experience has already shown us the futility of that hope. So we have sent forthwith our check and, while we don't expect to be totally satisfied with the use it is put to as KaMPAC pursues its arduous tasks, it should bring a better return than most of our other investments.—D.E.G.

***The Fall Meeting
of the***

KMS HOUSE OF DELEGATES

Sunday, November 3, 1974—10:00 A.M.

Holiday Inn—Emporia

One-day business meeting to consider items relating to legislation and others that cannot be delayed until May. It is hoped all component societies will be represented by their full complement of delegates.

All members of the Society are invited.

PSRO

An Excerpt of Proponent Opinions

JOHN N. BLANK, M.D.,* Hutchinson

DURING THE PAST one to three years, really five pieces of legislation have been or are being considered. Two of these are now law. Two more are extremely likely to become law, with the fifth—National Health Insurance—likely to be shelved for this year.

I have heard Henry E. Simmons, M.D., Deputy Assistant Secretary of HEW, speak twice on the subject of PSRO. I have heard Robert B. Hunter, Chairman, AMA Advisory Committee on PSRO, speak on two formal occasions and several times in discussion sessions. I attended the AMA meetings in Anaheim and in Chicago. I heard Senator Bennett present and defend the Bennett Amendment to Social Security at a national meeting, and was privileged to have a one-to-one discussion with him following his presentation.

What follows is a collection of notes taken during the above discussions.

In the words of Dr. Henry E. Simmons, not necessarily a direct quote, the following was delivered in a lecture.

Having studied this program for a year, and having lived with it virtually night and day for the past six months since I have been directly responsible for it, I would like to share with you what I believe it is, and what the law and regulations say it will be.

PSRO is potentially the most important piece of health legislation ever enacted. It concerns itself with improving the quality of care and educating the profession and the public in this area. I believe that there would be general agreement in this room that since the public cannot protect itself in this area, our profession has an obligation to have in place in this country a system that ensures the delivery of quality care. And if there were no PSRO law and we were sitting down as a committee-as-a-whole, starting from scratch to design an adequate system which could work in our interest and in the public's interest, I believe we would insist on the following: a system controlled by the profession, operated under flexible, locally set standards determined by practicing physicians, with work reviewed only by physicians, and the final judgments as to what constitutes quality care reserved for the profession. You would insist on that, and so would I. If you will strip

away emotions and forget the word "PSRO" and take the trouble to study the legislation and the rules under which PSRO will operate, you will see that that is what they both really provide.

The PSRO legislation, as simply as I can put it, calls for groups of local physicians in a defined geographic area to take on the following responsibilities: (1) To sit down and develop standards for medical care on the basis of best professional judgment, experience, and analysis of medical literature, and to determine where it is appropriate to deliver that care; (2) Having done so, to see that the care rendered in your area is rendered compatible with those standards; (3) To modify those standards as appropriate; (4) When you identify instances where care is being rendered outside those standards, to find out why. If it is appropriate, as in many instances it will be, approve it. If it is inappropriate, take appropriate actions to see that it does not continue to exist. Most of the time, that action on your part will be an educational one. That is what PSRO is about.

Now, to answer some specific questions. Who will set the standards? And this is asked everyplace in the country. Well, the local PSRO decides under which standards it will practice. And there is one thing that continually comes through in talking to physicians throughout this country: they speak of PSRO as some foreign entity, some strange foreign force outside the profession. Gentlemen, PSRO by definition is you. You are the PSRO. You, as you choose to organize in your area, are what PSROs are all about. It isn't some strange group of people on the outside, it's you the physicians in that area. And you have the authority to set these standards. Now it is true that virtually every specialty society in this country is working on standards, and they are working under an AMA umbrella (under Dr. Claude Welch, who is presently President of the American College of Surgeons), to develop sample standards. Those standards will be disseminated through the national PSRO Council, on which Dr. Hunter sits, to every PSRO in this country, all 203 of them.

The PSRO is free to do one of three things: it can adopt them; it can reject them; or it can set its own. And what it does decide is up to that PSRO. Are the standards inflexible, are they guides or are they set in

* President, the Kansas Medical Society.

concrete? Well, the fact is—as anyone who has practiced medicine understands—there is no standard that we can ever develop which will appropriately cover every instance of care. The standards are there to identify areas which fall outside that standard which needs your attention. Much of the time, as I said, care will be legitimately outside the standards because of peculiarities of disease, the patient, or the locality in which that patient is ill, and that the peers will approve, as they should. And that care will be paid for. Where it is not appropriate, the peer group then has to decide why, and to take effective action, educational or otherwise, to see that it does not happen again. But those standards have to be flexible.

The complaint is made that PSRO will destroy confidentiality. Now that is something that obviously has to be protected against. However, those who raise that issue are sounding a fairly hollow issue, because confidentiality has been a potential problem for 20 years in this country, ever since we started to have claim forms and insurance companies, and intermediaries, and Medicare, and Medicaid. That is hardly new today. What is new today, under PSRO legislation, is that for the first time there are stringent penalties built into federal law against anyone who would broach confidentiality. We have been operating under Title 18 and 19 for nine years now, under a system which did not have that protection built in. But that is not enough; we have to do whatever is necessary in the regulations to maximally protect confidentiality.

Under PSRO for the first time, we have something occurring that, I think, is very important for all of us to understand. One of the major complaints in the profession—and it was my complaint when I was practicing just a few short years ago—is that under the present system (that is, not PSRO) the final judgment as to what is quality care in this country and what will be paid for, is not a medical judgment. That judgment is in the hands of intermediaries, the carriers, the Medicare and Medicaid programs.

Under PSRO, for the first time, that judgment, as to what is quality care and what will be paid for by federal programs, is a function of PSROs. It will eliminate retroactive denial; it will eliminate laymen and nonprofessionals from making that judgment. As a PSRO becomes functional, all the other existing federal laws which are on the books right now and which have to be made operative if the PSRO does not come about in your area, have to be enforced. Gentlemen, let me tell you, if you will carefully consider those, they are onerous; they, in fact, do allow the states and those outside our profession to tell us what quality care is. And if there is one thing that probably is going to be the biggest influence in making PSRO work in this

country, it is the possibility that as PSRO becomes operational, for the first time, the professional judgment in the area will be the final judgment.

The other statement, and perhaps this is the most important one to discuss, is that PSRO is a cost control program, and cares nothing for quality. I think, the most obvious answer to that is to understand what PSRO asks us to do as a profession. It asks us to sit down and develop standards for quality care. It does not ask us to develop one for a white man, another for a black man, an oriental, a rich man, or a poor man. It asks us to develop a standard. It does not ask us what the cost of that standard is. It says, what is reasonable to deliver to this country, and in which setting it should be delivered. I believe that is the best answer to whether it is a quality program or a cost control program. A cost control program is fundamentally different: it says we are going to spend a certain amount of dollars. Somebody figures out a way to develop a cheap standard so that the care which is necessary falls under that umbrella. That is not what PSRO asks; it gives us the other responsibility to set the standard and get that care delivered.

Dr. Richard B. Hunter, Chairman of AMA Advisory Committee on PSRO—again, not necessarily a direct quote:

In calling on AMA to decide where it stands on PSRO, it is critically important that this be done, so that they can move one way or the other. Either way the program is going to go on. It certainly makes more sense for the profession to run this program. "There is more at stake in Chicago at the June meeting than a simple statement of policy. The real issue is whether or not our profession and our state and national organizations are going to allow themselves to be divided, threatened, and perhaps destroyed by the implementation of a law which, when reduced to its basics, cannot be called undesirable.

Gentlemen, that is from a man who has studied the issue in depth, and there are very few around who have.

Senator Bennett, who is the father of this amendment and a man much misunderstood by the profession, made a statement printed in the *Congressional Record*, Senate Debates, August 20, 1970. He said, 'I believe that physicians properly organized and with the proper mandate are capable of conducting an ongoing effective review program which would eliminate much of the present criticism of the profession and help enhance their stature as honorable men in an honorable vocation, willing to undertake necessary and broad responsibility for overseeing professional functions. If medicine accepts this role and fulfills its responsibility, then the government will not be giving (inaudible) to this area of concern.'

Make no mistake. The direction of the House passed Social Security bill is toward more, not less, review of the need for quality of health care. I believe my amendment would provide the necessary means on which organized medicine could assume responsibility with that review. In my opinion, if ultimately enacted, the PSRO proposal now being drafted would provide physicians with an imaginative and exciting opportunity to assume basic responsibility for reviewing health care as a whole. It would scrap the piecemeal review activities of peer ineffectiveness which have prevailed since 1966."

In April 1973, Senator Bennett, speaking at a national medical meeting in Kansas City, repeated the above and pleaded with the national and state officers of AAFP to become involved and help implement this legislation. Later, in a one-to-one conversation, he stated that if the implementors of this legislation, the federal bureaucrats, did not carry out his intent in the implementation, he personally would come out of retirement and lobby for repeal or amendment satisfactory to the medical profession.

After four years of studying, reading, and attending lectures on this program, I believe the Kansas Medical Society has an opportunity to really help itself. Further, I believe the leadership is dedicated to what is best for Kansas medicine. I further believe that it will take all the leadership we can muster to have the profession in Kansas come to understand it.

I apologize for so many words. The real purpose of all this is to express my concern and belief that the implementation of the Kansas Foundation, and getting it designated as a PSRO for Kansas, is the next and most important obligation facing your officers and the Kansas Foundation. About one million dollars is involved when this designation is made. The federal government does not give out this kind of money without a strong commitment to the organization designated as PSRO. We have some 1,400 who have signed an intent to participate in the Foundation. A similar number signing an intent to participate in PSRO, which in essence states that the Kansas Foundation represents you, gets the program off to a successful start.

Personalities

Clair C. Conard, Dodge City, spoke on heart attacks and coronary diseases to the local Lions Club.

Governor Docking has named **Richard C. Tozer**, Topeka, to the Kansas Cultural Arts Advisory Council.

Kenneth L. Graham, Leavenworth, has been presented the Executive Vice Chancellor's Medal by Dr. Rieke, for his contributions to KUMC.

Announcing their retirement from medical practice are **John F. Barr**, Ottawa, after 45 years; **Earl A. Martin**, Parsons, after 28 years; and **Charles H. Miller**, Parsons, after 40 years.

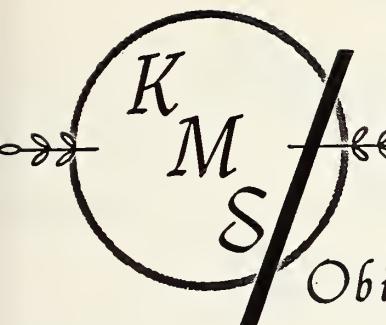
Henry Aldis, Fort Scott, spoke on natural and surgical menopause to the LPN Association convention.

The 5th International Parathyroid Hormone Conference held at Oxford, England, was attended by **Barbara P. Lukert**, Kansas City.

Ronald D. Linhardt, Wichita, addressed the Wesley School of Nursing recently.

S. J. Farha and **A. P. Michelbach**, Wichita, presented a paper on "Indications for Coronary Angiograms and Coronary Artery Surgery" at the Butler-Greenwood County Medical Society meeting.

Governor Docking has reappointed **Thomas F. Taylor**, Salina, to another three-year term on the Kansas Coordinating Council for Health Planning.



K
M
S

Obituaries

ABRAHAM C. EITZEN, M.D.

Dr. Abraham Clement Eitzen, 83, of Hillsboro, died July 4, 1974. He was born near Hillsboro, April 21, 1891.

Dr. Eitzen was graduated from Rush Medical School, Chicago, in 1922. He established his medical practice in Hillsboro in 1923.

Survivors include his wife and three daughters.

FREDERIC B. EMERY, M.D.

Dr. Frederic B. Emery, of Concordia, died June 27, 1974, at the age of 57. He was born January 21, 1917, in Seneca.

Dr. Emery was graduated from Rush Medical College, Chicago, in 1942. He established his medical practice in Concordia, in 1950.

Surviving Dr. Emery are his wife and two daughters. A memorial scholarship fund has been established at the University of Kansas.

JOHN W. SCHMAUS, M.D.

Dr. John W. Schmaus, of Iola, died July 7, 1974, at the age of 46. He was born April 22, 1928, in Halstead.

Dr. Schmaus was graduated from the University of Kansas School of Medicine in 1952.

HAROLD H. WOODS, M.D.

Dr. Harold H. Woods, 80, of Topeka, died June 12, 1974. He was born January 23, 1894, in Auburn, Nebraska.

Dr. Woods was graduated from the University of Nebraska School of Medicine in 1921. He established his medical practice in Topeka in 1931.

Surviving Dr. Woods are his wife, a daughter, and a son.

Woman's Auxiliary



K.M.S. Auxiliary Fall Conference—Workshop

October is a big month for all leaders in the KMS Auxiliary. October is the month that the national Auxiliary has chosen for major committee chairmen of all 50 states to meet for the national Auxiliary workshops. These will be smorgasbords of information. Immediately following this, Kansas will have its own banquet. After having participated in the national workshop, Kansas chairmen will bring back to county Auxiliary leaders the insights and information they gained in Chicago. There will be special sessions with county presidents, presidents-elect, treasurers, membership chairmen, and the chairmen of legislation, communications, AMA-ERF, and all health committee areas.

On October 23-24, all the state and county leaders of the KMS Auxiliary will meet in Wichita. We hope to mix fun and enjoyment with the Auxiliary business and pass on the education and ideas gleaned from the Chicago workshop.

We will also hear from the county leaders their new areas of need and cooperation, and their new activities so that by sharing we can keep our auxiliaries stimulated and working.

A special speaker, Dr. Rex Kenyon, a board member of AMPAC, and a panel on local and national legislation made up of Dr. Kenyon; Dr. H. Tom Gray, Wichita, K.M.S. Legislation Chairman; and Mr. Dave Morrison, AMA's Field Service Director for our region, are on the agenda. They will answer questions important to doctors, their wives, and their patients.

Leadership is the most important commodity in any volunteer organization. Through its leaders, the Auxiliary invites all its members to the enjoyment of sharing a common interest and participating in a wide area of activities. One lady speaking of our Auxiliary dues, said: "Where else can we get so much for so little, today?" At the Kansas Fall Conference-Workshop we hope to train and entertain the present and future leaders of the county Auxiliaries. If your wife is among those invited to attend, you should be proud of her. I hope you'll encourage her to join us in mid-October. The state Auxiliary to KMS knows that its strength is in its county organizations and the people carrying our message to each individual area of Kansas.

I hope your wife will be joining us. We need her to do an effective job.

Sincerely,
Dot Meyer
President,
Woman's Auxiliary to the
Kansas Medical Society

Fat Embolism

(Continued from page 305)

The Eye

In those dying with systemic embolism, histology may reveal emboli in the capillaries of the choroid and retina. The large number of emboli in retinal capillaries is well visualized by fat staining after removal of the retina, mounting it on a slide, and digestion with trypsin. Petechial hemorrhages and pale whitish foci may be visualized in the fundi by ophthalmoscopic examination *in vivo*. The nature of the pale zones is uncertain, but presumably they are local foci of edema or exudation. They are not fat emboli.

Studies of the visual fields have shown the presence of scotoma in a few cases of fat embolism. These resolved within weeks, leaving vision unimpaired.

References

1. Sevitt, S.: *Fat Embolism*. London, Butterworths, 1962.
2. Sevitt, S.: *Reactions to Injury and Burns, and Their Clinical Importance*, Chapter 13. London, Heinemann, 1974.

Welcome to Portland, Oregon for the 28th Clinical Convention

November 30-December 4, 1974



"In this age of specialization, there's a vital need for discussion of the broader implications of new-found knowledge. The 28th AMA Clinical is designed for that purpose...to bring together physicians of the various specialties to study and discuss the broader aspects of medicine as they apply to their practices."

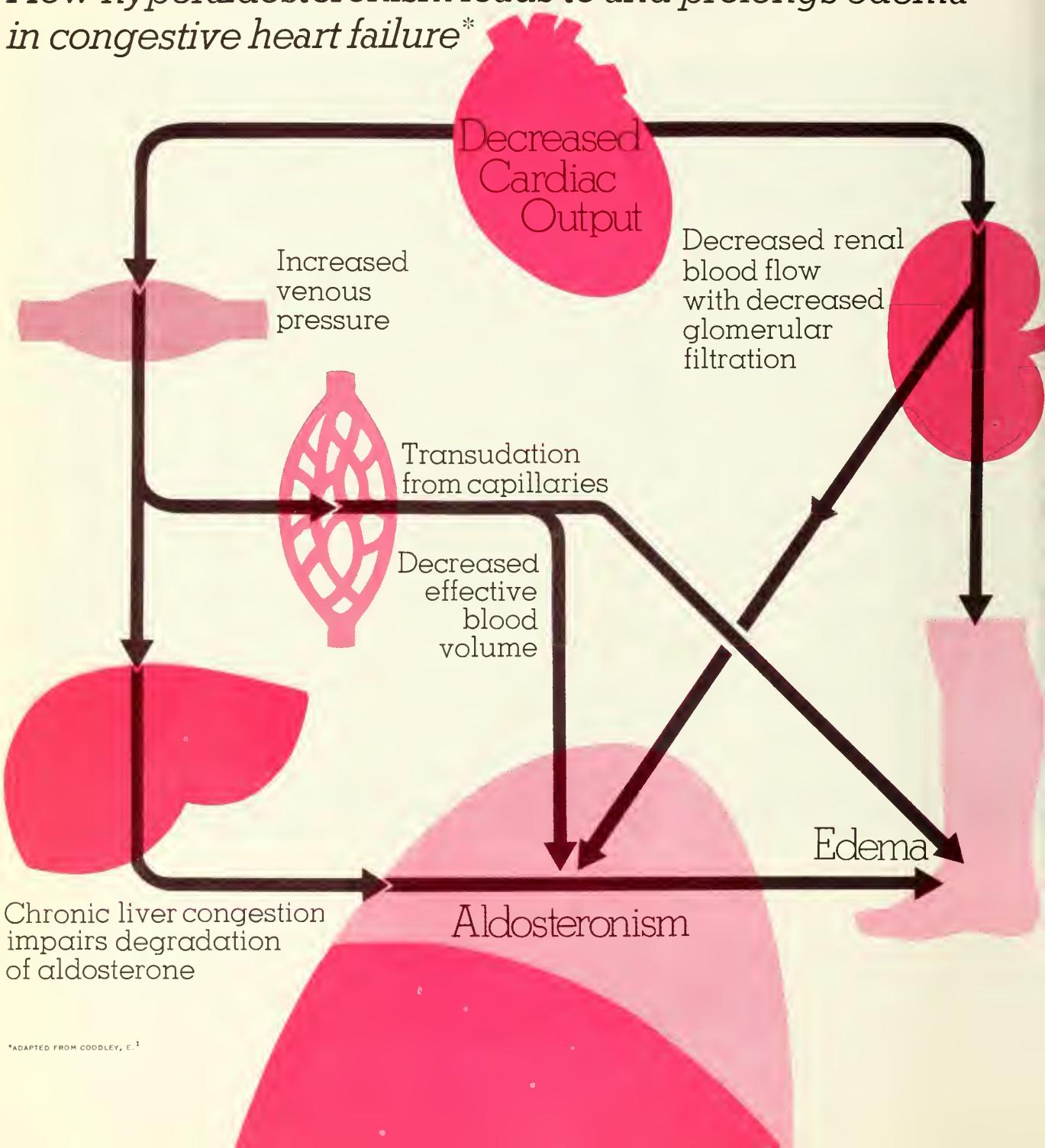
Huldrick Kammer, M.D., Chairman
Council on Scientific Assembly



For further details, write:
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American Medical Association
535 North Dearborn Street
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In congestive heart failure... secondary aldosteronism

*How hyperaldosteronism leads to and prolongs edema in congestive heart failure**



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1. As the only diuretic

- Often sufficient alone.
- Produces gradual, sustained diuresis by blocking aldosterone action in the distal renal tubule.
- Avoids potassium loss.

2. As the basic daily diuretic with an "add-on" alternate-day-diuretic ("A.D.D." schedule)

- Can be administered daily as basic therapy with the additional agent (furosemide or ethacrynic acid) given every second or third day.
- Aldactone plus "A.D.D." schedule minimizes potassium deficiency and potentiates effect of "add-on" diuretic.²
- Avoids acute volume depletion and aldosterone rebound.²

3. As a daily diuretic in combination with a daily dose of a thiazide

- Permits daily additive diuretic effect while maintaining potassium balance.

Indications—Essential hypertension; edema or ascites of congestive heart failure; cirrhosis of the liver and the nephrotic syndrome; idiopathic edema. Some patients with malignant effusions may benefit from Aldactone (spironolactone), particularly when given with a thiazide diuretic.

Contraindications—Acute renal insufficiency, rapidly progressing impairment of renal function, onuria and hyperkalemia.

Warnings—Potassium supplementation may cause hyperkalemia and is not indicated unless a glucocorticoid is also given. Discontinue potassium supplementation if hyperkalemia develops. **Usage of any drug in women of childbearing age requires that the potential benefits of the drug be weighed against its possible hazards to the mother and fetus.**

Precautions—Patients should be checked carefully since electrolyte imbalance may occur. Although usually insignificant, hyperkalemia may be serious when renal impairment exists; deaths have occurred. Hyponatremia, manifested by dryness of the mouth, thirst, lethargy and drowsiness, together with a low serum sodium may be caused or aggravated, especially when Aldactone is combined with other diuretics. Elevation of BUN may occur, especially when pretreatment hyperazotemia exists. Mild acidosis may occur. Reduce the dosage of other antihypertensive drugs, particularly the ganglionic blocking agents, by at least 50 percent when adding Aldactone since it may potentiate their action.

Adverse Reactions—Drowsiness, lethargy, headache, diarrhea and other gastrointestinal symptoms, maculopapular or erythematous cutaneous eruptions, urticaria, mental confusion, drug fever, ataxia, gynecomastia, inability to achieve or maintain erection, mild androgenic effects, including hirsutism, irregular menses and deepening voice. Adverse reactions are infrequent and usually reversible.

Dosage and Administration—For essential hypertension in adults, the daily dosage is 50 to 100 mg. in divided doses. Aldactone may be combined with a thiazide diuretic if necessary. Continue treatment for two weeks or longer since an adequate response may not occur sooner. Adjust subsequent dosage according to response of patient.

For edema, ascites or effusions in adults initial daily dosage is 100 mg. in divided doses. Continue medication for at least five days to determine diuretic response; add a thiazide or organic mercurial if adequate diuretic response has not occurred. Aldactone dosage should not be changed when other therapy is added. A daily dosage of Aldactone considerably greater than 75 mg. may be given if necessary.

A glucocorticoid, such as 15 to 20 mg. of prednisone daily, may be desirable for patients with extremely resistant edema which does not respond adequately to Aldactone and a conventional diuretic. Observe the usual precautions applicable to glucocorticoid therapy; supplemental potassium will usually be necessary. Such patients frequently have an associated hyponatremia—restriction of fluid intake to 1 liter per day or administration of mannitol or urea may be necessary (these measures are contraindicated in patients with uremia or severely impaired renal function). Mannitol is contraindicated in patients with congestive heart failure, and urea is contraindicated with a history or signs of hepatic coma unless the patient is receiving antibiotics orally to "sterilize" the gastrointestinal tract.

Glucocorticoids should probably be given first to patients with nephrosis since Aldactone, although useful for diuresis, will not directly affect the basic pathologic process.

For children the daily dosage should provide 1.5 mg. of Aldactone per pound of body weight.

References: 1. Coodley, E.: *Consultant* 12:106-107, 109, 111, 113, 115 (July) 1972. 2. Thorn, G. W., and Louler, D. P.: *Am. J. Med.* 53:673-684 (Nov.) 1972.

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The Role of the Detail Man



Dr. Willard Gobbell
Family Physician
Encino, California

"I may be prejudiced, but I am very much in favor of the detail men I meet. Most of them are knowledgeable about the drugs they promote and can be a great help in acquainting me with new medication."

Family Physician's Perception

I think that most general practitioners in this area feel as I do about the detail man. Over the years I have gotten to know most of the men who visit me regularly and they in turn have become aware of my particular interests and the nature of my practice. They, therefore, limit their discussion as much as possible to the areas of interest to me. Since I usually see the same representative again in future visits, it is in his best interest to supply me with the most honest, factual, as well as up-to-date information about his products.

Dr. Jeremiah Stamler
Chairman
Department of Community
Health and Preventive
Medicine, and Dingman
Professor of Cardiology
Northwestern University
Medical School



"In the total picture of dealing with health problems in this country, there is a potential for detail men to play a meaningful role."

The Positive Influence

My contact with representatives and salesmen of the pharmaceutical industry is the type of contact that people in a medical center, research people, and academic people have and that's in all likelihood on a somewhat different level from that of the practicing physician.

Let me touch on how I personally perceive the role of the sales representative. These men reach large numbers of health professionals. Thus they could be—and at times actually are—disseminators of useful information. They could consistently serve a real educational function in their ability to discuss their products.

At present they do distribute printed material, brochures and pamphlets—some of it scientifically sound and therefore truly useful—as well as some excellent films produced by the pharmaceutical industry. When they function in this

Opinion
&
Dialogue

Detail Man a Source of Information?

Yes, with certain reservations. The average sales representative has a great fund of information about the drug products he is responsible for. He is usually able to answer most questions fully and intelligently. He can also supply reprints of articles that contain a great deal of information. Here, I exercise some caution. I usually accept most of the statements and opinions that I find in the papers and studies which come from the larger teaching facilities. This does without saying that a physician should also rely on other sources for his information on pharmacology.

Training of Sales Representatives

Ideally, a candidate for the position as a sales representative of a pharmaceutical company should be a graduate pharmacist who has a questioning mind. I don't think this is possible in every case, and so it becomes the responsibility

of the pharmaceutical company to train these individuals comprehensively. It is of very great importance that the detail man's knowledge of the product he represents be constantly reviewed as well as updated. This phase of the sales representative's education should be a major responsibility of the medical department of the pharmaceutical company.

I am certain that most of these companies take special care to give their detail men a great deal of information about the products they produce—information about indications, contraindications, side effects and precautions. Yet, although most of the detail men are well informed, some, unfortunately, are not. It might be helpful if sales representatives were reassessed every few years to determine whether or not they are able to fulfill their important function. Incidentally, I feel the same way about periodic assessments of everyone

in the health care field, whether they be general practitioners, surgeons or salesmen.

Value of Sampling

I personally am in favor of limited sampling. I do not use sampling in order to perform clinical testing of a drug. I feel that drug testing should rightly be left to the pharmacology researcher and to the large teaching institutions where such testing can be done in a controlled environment.

I do not use samples as a "starter dose" for my patients. I do, however, find samples of drugs to be of value in that they permit me to see what the particular medication looks like. I get to see the various forms of the particular medication at first hand, and if it is in a liquid form I take the time to taste it. In that way I am able to give my patients more complete information about the particular medications that I prescribe for them.

Capacity they are indeed useful; particularly in the fact that they disseminate broadly based educational material and serve not just "pushers" of their drugs.

The Other Side of the Coin

Obviously, the pharmaceutical companies are not producing all material as a labor of love—they are in the business of selling products for profit. In this regard the ambitious and improperly motivated sales representative can exert a negative influence on the practicing physician, both by presenting a one-sided picture of his product, and by encouraging the practitioner to depend too heavily on drugs for his total therapy. In these ways, the salesman has often distorted objective reality and undermined his potential role as an educator.

Industry Responsibility

Since the detail man must be an information resource as well as a representative of his particular pharmaceutical company, he should be carefully selected and

thoroughly trained. That training, however, must be an ongoing one. There must be a continuing battle within and with the pharmaceutical industry for high quality not only in the selection and training of its sales representatives, but also in the development of all of its promotional and educational material.

The industry must be ready to accept constructive as well as corrective criticism from experts in the field and consumer spokesmen, and be willing to accept independent peer review. The better educated and prepared the salesman is, the more medically accurate his materials, the better off the pharmaceutical industry, health professionals and the public—i.e., the patients—will be.

Physician Responsibility

The practicing physician is in constant need of up-dated information on therapeutics, including drugs. He should and does make use of drug information and answers to specific questions supplied by the pharmaceutical representative. However, that informa-

tion must not be his main source of continuing education. The practitioner must keep up with what is current by making use of scientific journals, refresher courses, and information received at scientific meetings.

The practicing physician not only has the right, but has the responsibility to demand that the pharmaceutical company and its representatives supply a high level of valid and useful information. I feel certain that if such a high level is demanded by the physician as well as the public, this demand will be met by an alert and concerned pharmaceutical industry.

From my experience, my impression is that sectors of the pharmaceutical industry are indeed ethical. I challenge the industry as a whole to live up to that word in its finest sense.





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The private health care delivery system in Kansas exists in an environment that encourages adaptability, accessibility and accountability.

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The personal relationship between you and your doctor is the foundation of a great American privilege. Private medicine.

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Book Reviews*(Continued from page 8)*

nerable and suggestible. One is reminded of an article published some 30-40 years ago, by a widely circulated popular magazine, to the effect that glutamic acid could turn retardates into above average IQs. For months afterwards, it was the unhappy duty of this reviewer to inform hopeful parents of the true facts—and it is the desire of the reviewer to avoid this from happening again.

This is not a book to be "prescribed reading" for all parents of brain damaged children. For some of them, yes. It is urged that any prospective prescriber read the book before putting it into the hands of parents.—*J.E.C.M.*

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The Family Health Care Center of Lawton, Oklahoma is in need of a Medical Director IMMEDIATELY! This is a real opportunity for a physician interested in administrative medicine as well as direct patient care. The salary is negotiable. Additional information and applications may be obtained from Mr. Arthur G. Price, Jr., Family Health Care Services, Inc., 410 Lee Boulevard, Lawton, Oklahoma (73501), or call (405) 248-6205 collect.

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Do you know a pregnant girl who is not married? For such a problem pregnancy, suggest that she contact the Florence Crittenton Services, Topeka, Kansas (913) 233-0516.

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Maybe the patient's self-diagnosis is right. He could have hay fever. But that bright red nasal mucosa, along with the thick discharge and excoriation around the nares, strongly suggests that the main problem is a cold. Hay fever or another form of allergic rhinitis may or may not be an underlying factor.

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WARNINGS: Use in children: In infants

and children, particularly, antihistamines in overdosage may produce convulsions and death.

PRECAUTIONS: Administer with care to patients with cardiac or peripheral vascular diseases or hypertension. Until the patient's response has been determined he should be cautioned against engaging in operations requiring alertness such as driving an automobile, operating machinery, etc. Patients receiving antihistamines should be warned against possible additive effects with CNS depressants

FU: CNS depression, hypotension, sedation, tranquilizers, etc.

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when pain goes on... and on... and on-



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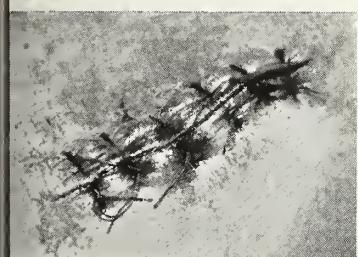
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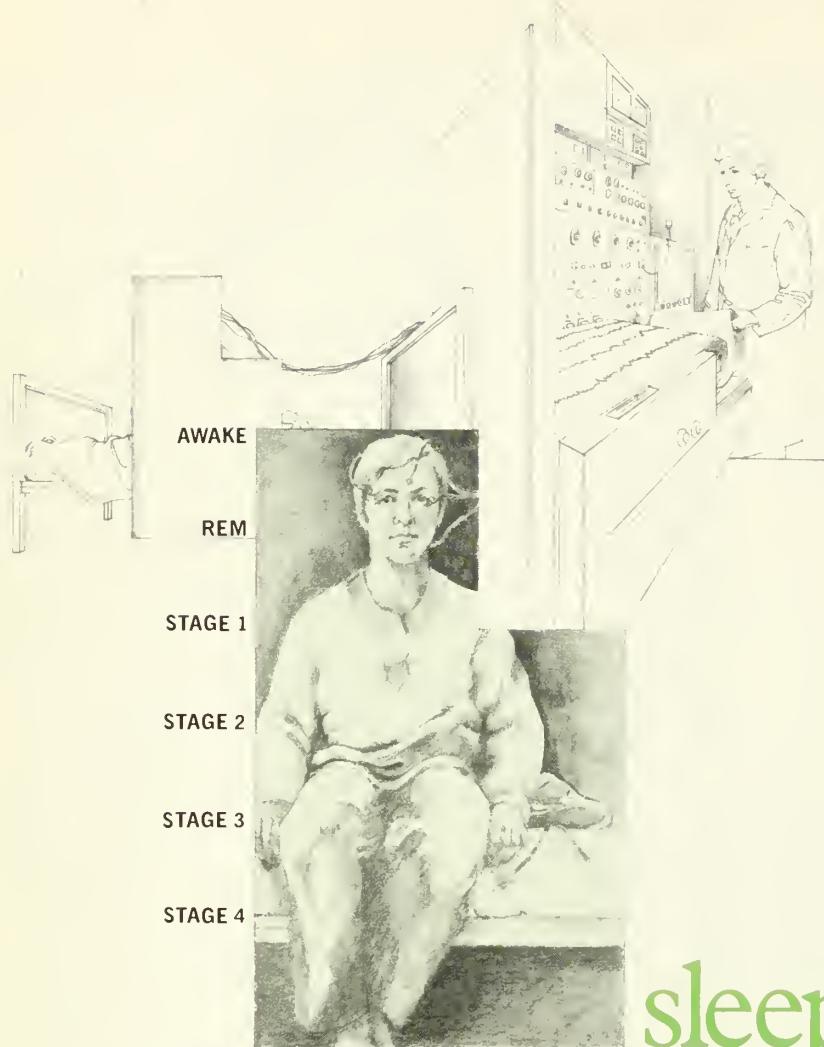
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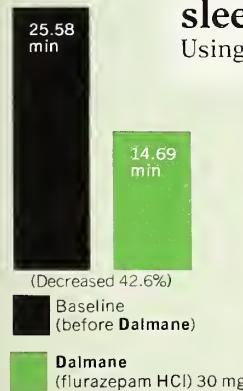
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Three insomnia patients selected for difficulty falling asleep were administered Dalmane (flurazepam HCl) 30 mg for 14 consecutive nights. Placebo was given for four nights prior to and four nights after Dalmane. Physiologic tracings on Dalmane nights 1-3 showed sleep induction time averaged 13.90 minutes; on Dalmane nights 12-14, 18.80 minutes. Combined average for the 6 monitored drug nights was 16.35 minutes.¹

Average Time Required
to Fall Asleep (4 Studies,
16 Subjects²⁻⁵)



confirmed by clinical studies in four geographically separated sleep research laboratories²⁻⁵

Using a 14-night protocol involving eight insomniac and eight normal subjects, four studies confirmed the sleep-inducing effectiveness of Dalmane (flurazepam HCl) and the reproducibility of this response. On average, one 30-mg capsule induced sleep within 17 minutes. In all these studies, Dalmane induced sleep rapidly, reduced nighttime awakenings, and provided 7 to 8 hours of sleep without repeating dosage²⁻⁵.

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Dalmane is generally well tolerated; morning "hang-over" has been relatively infrequent. While dizziness, drowsiness, lightheadedness and the like have been noted most often, particularly in the elderly and debilitated, physicians should be aware of the possibility of more serious reactions, as noted below.

Before prescribing Dalmane (flurazepam HCl), please consult Complete Product Information, a summary of which follows:

Indications: Effective in all types of insomnia characterized by difficulty in falling asleep, frequent nocturnal awakenings and/or early morning awakening; in patients with recurring insomnia or poor sleeping habits; and in acute or chronic medical situations requiring restful sleep. Since insomnia is often transient and intermittent, prolonged administration is generally not necessary or recommended.

Contraindications: Known hypersensitivity to flurazepam HCl.

Warnings: Caution patients about possible combined effects with alcohol and other CNS depressants. Caution against hazardous occupations requiring complete mental alertness (e.g., operating machinery, driving). Use in women who are or may become pregnant only when potential benefits have been weighed against possible hazards. Not recommended for use in persons under 15 years of age. Though physical and psychological dependence have not been

reported on recommended doses, use caution in administering to addiction-prone individuals or those who might increase dosage.

Precautions: In elderly and debilitated, initial dosage should be limited to 15 mg to preclude oversedation, dizziness and/or ataxia. If combined with other drugs having hypnotic or CNS-depressant effects, consider potential additive effects. Employ usual precautions in patients who are severely depressed, or with latent depression or suicidal tendencies. Periodic blood counts and liver and kidney function tests are advised during repeated therapy. Observe usual precautions in presence of impaired renal or hepatic function.

Adverse Reactions: Dizziness, drowsiness, lightheadedness, staggering, ataxia and falling have occurred, particularly in elderly or debilitated patients. Severe sedation, lethargy, disorientation and coma, probably indicative of drug intolerance or overdosage, have been reported. Also reported were headache, heartburn, upset stomach, nausea, vomiting, diarrhea, constipation, GI pain, nervousness, talkativeness, apprehension, irritability, weakness, palpitations, chest pains, body and joint pains and GU complaints. There have also been rare occurrences of sweating, flushes, difficulty in focusing, blurred vision, burning eyes, faintness, hypotension, shortness of breath, pruritus, skin rash, dry mouth, bitter taste, excessive salivation, anorexia, euphoria, depression, slurred speech, confusion, restlessness, hallucinations, and elevated SGOT, SGPT, total and direct bilirubins and alkaline phosphatase. Paradoxical reactions, e.g., excitement, stimulation and hyperactivity, have also been reported in rare instances.

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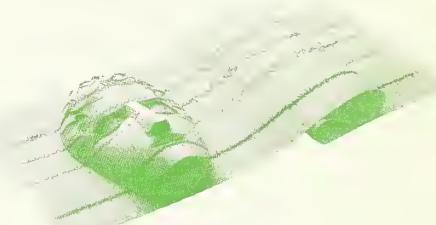
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2. Karacan I, Williams RL, Smith JR: The sleep laboratory in the investigation of sleep and sleep disturbances. Scientific exhibit at the 124th annual meeting of the American Psychiatric Association, Washington DC, May 3-7, 1971

3. Frost JD Jr: Data on file, Medical Department, Hoffmann-La Roche Inc, Nutley NJ

4. Vogel GW: Data on file, Medical Department, Hoffmann-La Roche Inc, Nutley NJ

5. Dement WC: Data on file, Medical Department, Hoffmann-La Roche Inc, Nutley NJ



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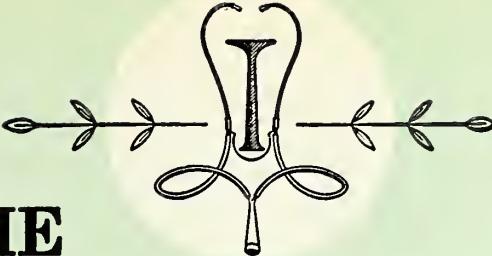
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*E.D. Freis: The Modern Management of Hypertension, V.A. Information Bulletin, 11-35.

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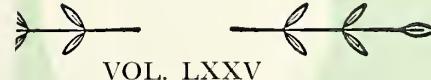


THE
Journal

ACP Issue

OF THE
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1974



VOL. LXXV
NO. XI

Both often



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Associated
• depressive
symptoms

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According to her major symptoms, she is a psychoneurotic patient with severe anxiety. But according to the description she gives of her feelings, part of the problem may sound like depression. This is because her problem, though primarily one of excessive anxiety, is often accompanied by depressive symptomatology. Valium (diazepam) can provide relief for both—as excessive anxiety is relieved, the depressive symptoms associated with it are also relieved.

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For further information on this subject, the following references are provided:

1. Henry BW, et al: *Dis Nerv Syst* 30:675-679, Oct 1969.
2. Hollister LE, et al: *Arch Gen Psychiatry* 24:273-278, Mar 1971.
3. Claghorn J: *Psychosomatics* 11:438-441, Sept-Oct 1970.



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Observe usual precautions in impaired renal or hepatic function. Limit dosage to smallest effective amount in elderly and debilitated to preclude ataxia or oversedation.

Side Effects: Drowsiness, confusion, diplopia, hypotension, changes in libido, nausea, fatigue, depression, dysarthria, jaundice, skin rash, ataxia, constipation, headache, incontinence, changes in salivation, slurred speech, tremor, vertigo, urinary retention, blurred vision. Paradoxical reactions such as acute hyperexcited states, anxiety, hallucinations, increased muscle

spasticity, insomnia, rage, sleep disturbances, stimulation have been reported; should these occur, discontinue drug. Isolated reports of neutropenia, jaundice; periodic blood counts and liver function tests advisable during long-term therapy.



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The JOURNAL of the KANSAS MEDICAL SOCIETY

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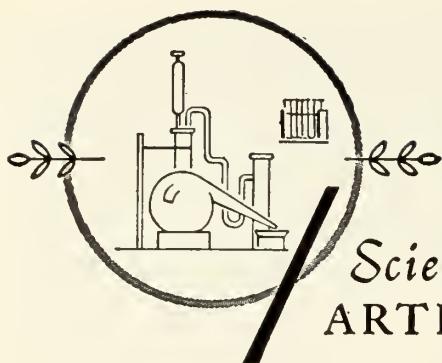
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American College of Physicians Issue

The November issue of the JOURNAL is customarily devoted to papers presented at the yearly Kansas Regional Meeting of the American College of Physicians.

The 46th anniversary meeting of the College was held February 22, 1974, in Overland Park, Kansas. The Program Chairman was Joseph L. Kyner, M.D., and the Chairman of Arrangements was Jack M. Catlett, M.D.

Doctor Kyner has made the collection and publication of these papers possible, for which the Editorial Board is grateful. The JOURNAL appreciates this yearly opportunity to expand the audience for these interesting and instructive papers which originated in Kansas.



Scientific ARTICLES

Myocardial Infarction

Structural Complications

SHERMAN M. STEINZEIG, M.D., and
ALAN E. ROTH, M.D., Kansas City, Kansas

ARRHYTHMIAS were once considered to be the most common cause of death from myocardial infarction.¹ Many were due to electrical instability of the heart, and at autopsy it was often difficult to find conclusive evidence of infarction. This fact led to the conception of the coronary care unit,² where techniques for prevention and treatment were developed with dramatic benefits to patients.

Arrhythmias still occur and remain an important aspect of management. However, the most common cause of infarct death in the hospital now is pump failure due either to severe left ventricular disease or to structural complications such as cardiac rupture, septal perforation, or papillary muscle rupture.³ The mortality rate from these causes is extremely high and has not as yet yielded to medical therapy.

For this reason, we decided to review the autopsy material from patients who died at Bethany Medical Center from January 1, 1971, to July 1, 1973.

Methods

Autopsy records for the period indicated were reviewed (*Table 1*). There were 208 autopsy deaths. Of these, 48 were considered to be due to acute or sub-

From the Departments of Cardiology and Pathology, Bethany Medical Center, Kansas City, Kansas 66102.

Presented at the annual meeting of the Kansas Chapter, American College of Physicians, Overland Park, February 22, 1974.

Address Reprint Orders to: Sherman M. Steinzeig, M.D., Bethany Medical Center, 51 North 12th St., Kansas City, Kansas 66102.

acute myocardial infarction. Patients with old arteriosclerotic or rheumatic disease were excluded from the study, unless the condition was complicated by an acute infarction. Nine of the infarct deaths were due to cardiac rupture, septal perforation, or papillary muscle rupture. These are the subject of this report.

Clinical data for the study group is outlined in *Table II*.

Cardiac Rupture

Spontaneous perforation or rupture of the ventricular myocardium is surprisingly common. It is reported to comprise from 4.3 to 19 per cent of infarct deaths.⁴ The syndrome is characterized in the literature⁵⁻⁷ as follows: (1) increased incidence in older age groups; (2) increased incidence in females; (3) no previous history of coronary artery disease; (4) high incidence of hypertension; (5) severe and protracted chest pain; (6) history of exertion as a precipitating factor; (7) electro-mechanical dissociation; (8) death most common within three days after infarction; (9) death within a few hours after rupture.

Five patients (10.4%) in our series succumbed to cardiac rupture. The age averaged 74 years. Four were females. None were significantly hypertensive during hospitalization. None had unusual clinical courses or exertion prior to death. The EKG in all cases showed evidence of antero-septal or antero-lateral infarction. There was development of right bundle branch block in two, and left anterior hemiblock in one. Three pa-

TABLE I

	Infarct Deaths			Structural Deaths*		
	Autopsy Deaths	NUMBER	PER CENT OF AUTOPSY DEATHS	NUMBER	PER CENT OF AUTOPSY DEATHS	PER CENT OF INFARCT DEATHS
1971	97	18	18.6	2	2.1	11.1
1972	67	15	22.4	2	3.0	13.3
1973 (6 mos)	44	15	34.1	5	11.4	33.3
Total	208	48	23.1	9	4.3	18.8

* Structural deaths refers to cardiac rupture, I.V. septal perforation, and ruptured papillary muscle.

tients showed electro-mechanical dissociation, in which there was organized EKG activity without discernible cardiac output for periods of up to 20 minutes. Rupture occurred from seven hours to five days after onset of the original pain of infarction. Four died within one hour, one within two hours after rupture. In all cases, the terminal event was characterized by recurrence of severe pain, fall in blood pressure and significant, acute EKG changes.

At autopsy, all were found to have acute infarction of the anterior, septal, or lateral areas of the left ventricle with rupture of the anterior left ventricular wall. Four showed no evidence of previous infarction. There was old patchy fibrosis in one case. The pathology findings are summarized in *Table III*. The EKG and gross

anatomical findings in case A-30-73 are illustrated in *Figures 1 and 2*.

Perforation of the Interventricular Septum

The reported incidence of this complication comprises about 2 per cent of infarct deaths.^{8, 9} There appears to be no age or sex differential. The perforation (or perforations) usually occurs in the course of an extensive infarction (more commonly anterior), resulting in large areas of septal necrosis. The acute event is usually heralded by the appearance of a loud, holosystolic murmur heard best along the left sternal border and accompanied by various degrees of congestive heart failure. Perforation occurs most commonly within the first week after infarction. The acute mortality is

TABLE II

Case	Sex	Age	Area of Infarction	Complication	Interval Between	
					INFARCT AND COMPLICATION	COMPLICATION AND DEATH
A-63-71	F	77	Antero-septal	Cardiac rupture	5 days	2 hours
A-59-72	M	65	Antero-septal	Cardiac rupture	12 hours	1 hour
A-67-72	F	80	Antero-septal	Cardiac rupture	7 hours	1 hour
A-30-73	F	76	Antero-septal and antero-lateral	Cardiac rupture	5 days	1 hour
A-31-73	F	74	Antero-septal	Cardiac rupture	4 days	1 hour
A-19-73	M	64	Posterior septum, post. and inf. left ventricle	I.V. septal perforation	5 days	3 hours
A-20-73	M	67	Posterior septum, post. and inf. left ventricle	I.V. septal perforation	Present on admission	4 days
A-27-73	M	71	Antero-septal and antero-lateral	I.V. septal perforation	6 hours	25 hours
A-36-71	F	51	Posterior septum, post. and inf. left ventricle	Ruptured papillary muscle	9 days	2 hours

TABLE III
CARDIAC RUPTURE

Case	Peak SGOT	Peak LDH	Heart Weight	Coronary Arteries			Pathology	EKG Findings
				RCA %	LAD %	LCX* %		
A-63-71	76	382	450 gm	50	95	50	Acute infarction of septum and anterior L.V. with rupture of anterior L.V. wall	Loss of R in V ₁ -V ₄ . Electro-mechanical dissociation
A-59-72	—	—	375 gm	90	100	90	Acute infarction of septum and anterior L.V. with rupture of anterior L.V. wall	Loss of R in V ₁ . Low amplitude R in V ₂ . S-T Seg elevation in V ₁ -V ₄ . Electro-mechanical dissociation
A-67-72	8	162	350 gm	80	100	80	Acute infarction of septum and anterior L.V. with rupture of anterior L.V. wall. Old patchy fibrosis	Q in I and AVL. Q in V ₂ -V ₃ . RBBB. Electro-mechanical dissociation
A-30-73	93	802	420 gm	50	100	50	Acute infarction of septum, ant. and lat. L.V. with rupture of anterior L.V. wall	Loss of R in V ₂ -V ₅ . Left anterior hemi-block. Atrial fibrillation
A-31-73	159	954	300 gm	90	100	50	Acute infarction of septum and anterior L.V. with rupture of anterior L.V. wall	Loss of R in V ₁ -V ₄ . RBBB. Atrial flutter. Atrial fibrillation. A-V dissociation

5/48 = 10.4% of infarct deaths.

* Figures refer to per cent occlusion of RCA = right; LAD = left anterior descending; LCx = left circumflex.

high, with few patients surviving two months. This condition must be differentiated from papillary muscle disease, which it closely resembles clinically.

Three patients (6.3%) in our series succumbed to perforation of the IV septum. The age averaged 67 years. All three were male. The EKG showed inferior wall infarction in two cases (one of which had a pre-existing right bundle branch block). The third case showed antero-septal infarction with development of right bundle branch block.

Septal perforation was suspected in each case because of the presence of an impressive murmur and congestive heart failure. The murmur was present on admission in one case (A-20-73). The patient expired four days after admission in intractable heart failure. One case developed a loud murmur six hours after admission and died 25 hours later in severe heart failure. The third case developed a murmur and heart failure five days after admission and died within three hours.

At autopsy, all showed extensive necrosis of the septum. Two cases showed infarction of the inferior and posterior left ventricular wall with perforation of the posterior septum. The other case showed massive in-

farction of the anterior left ventricular wall with necrosis of the septum extending through to the posterior wall. There was no evidence of previous infarction. The pathology findings are summarized in *Table IV*. The EKG and gross anatomical findings in case A-19-73 are illustrated in *Figures 3 and 4*.

Ruptured Papillary Muscle

Papillary muscle dysfunction, transient or permanent, is seen commonly in various degrees following myocardial infarction. Rupture is a rare complication accounting for less than 1 per cent of infarct deaths.^{10,11} It occurs in extensive infarcts, usually of the posterior wall. There is a loud mitral insufficiency murmur accompanied by the appearance of congestive heart failure. Death usually occurs within 24 hours, although some cases surviving longer have been reported. The syndrome must be distinguished from perforation of the IV septum.

One patient (2.1%) in our series succumbed to rupture of the left posterior (postero-medial) papillary muscle. This patient was a female who developed a murmur nine days after an extensive infero-posterior

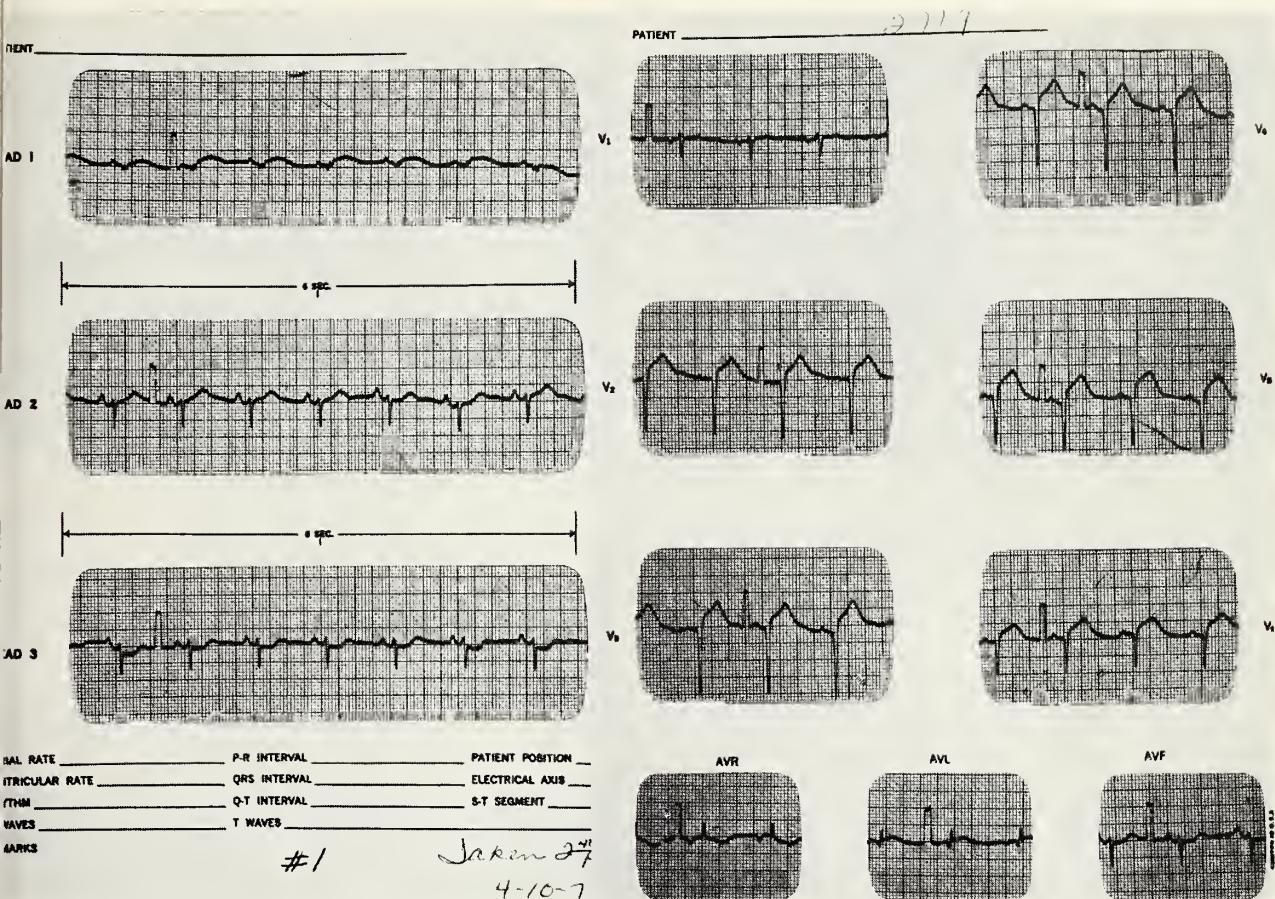


Figure 1. A-30-73.

TABLE IV
SEPTAL PERFORATION

Case	Peak SGOT	Peak LDH	Heart Weight	Coronary Arteries			Pathology	EKG Findings
				RCA %	LAD %	LCX %		
A-19-73	85	572	550 gm	95	90	80	Acute infarction of posterior septum and post. L.V. wall with rupture of post. septum	RBBB (old). Q in II, III, AVF. A-V dissociation
A-20-73	350	1720	400 gm	100	85	85	Acute infarction of posterior septum and post. L.V. wall with rupture of septum	Q in II, III, AVF.
A-27-73	123	725	520 gm	50	100	50	Acute infarction of ant. L.V. wall and septum extending to post L.V. wall with rupture of septum	Loss of R in V ₁ -V ₄ . RBBB.

3/48 = 6.3% of infarct deaths.



Figure 2

infarct. The patient died two hours later in severe congestive heart failure.

At autopsy, there was extensive infarction of the posterior and inferior wall of the left and right ventricular walls, with necrosis and rupture of the left

posterior papillary muscle. There was no previous infarction. The pathology findings are summarized in Table V. The EKG and gross anatomical findings in this case are illustrated in Figures 5 and 6.

Other Infarct Deaths

Thirty-nine other patients died of myocardial infarction. Sixteen of this group (42%) showed evidence of previous infarction compared with the study group in which only one patient showed old patchy fibrosis. This group in general had very severe narrowing or obstruction of major coronary vessels, often exceeding that of the study group. However, the latter all had severe narrowing or obstruction of the left anterior descending system, in addition to other vessels involved.

Many of the patients in this group had papillary muscle disease. Many also had extensive areas of damage, with thinning of the left ventricular wall or septum. This led to severe impairment of left ventricular function and power failure, which was the cause of death in most of these individuals.

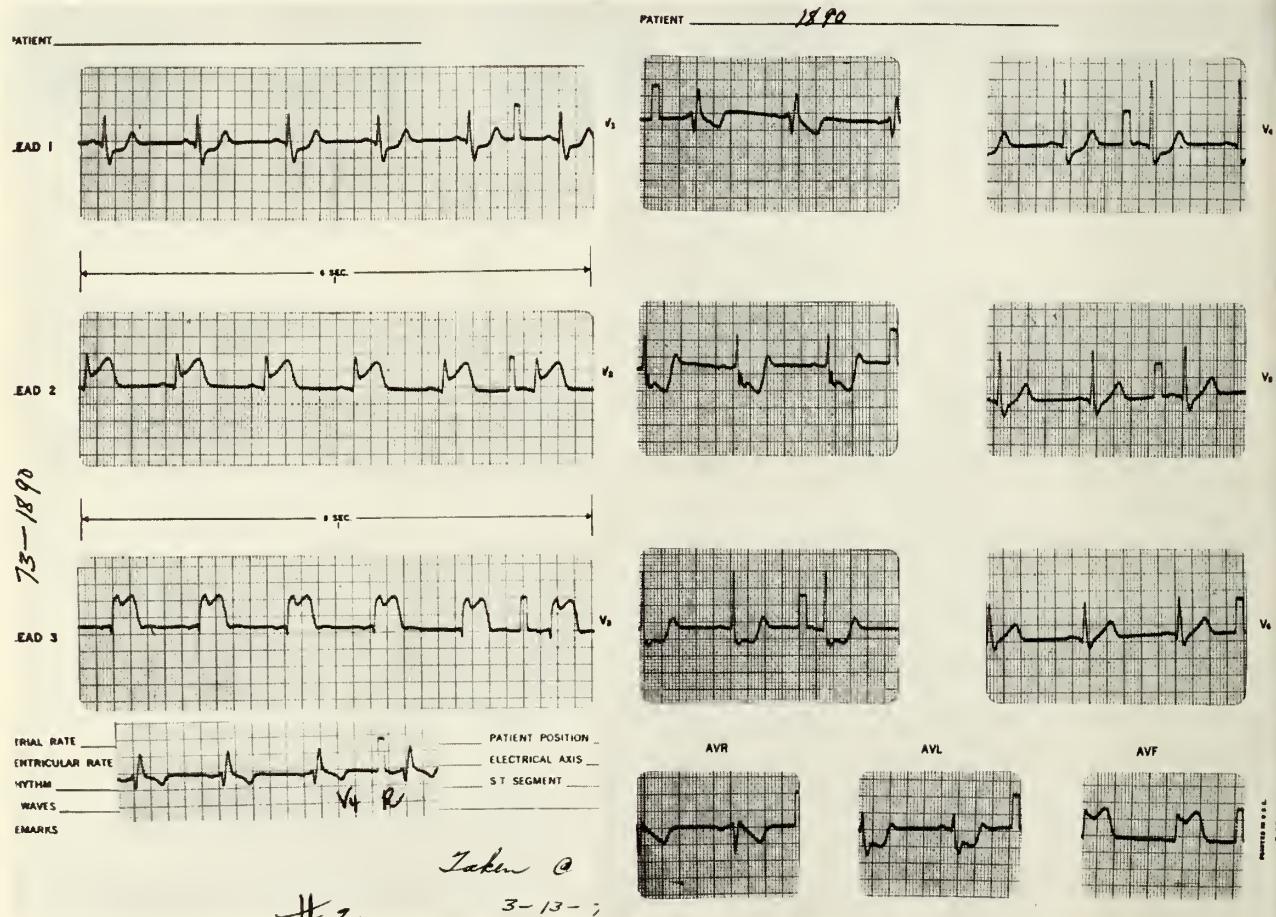


Figure 3. A-19-73.



Figure 4

Discussion

It appears to the authors that hearts examined postmortem at this institution are much sicker now than in former years. While our series is small and not statistically significant, we were impressed by the severity of left ventricular and coronary artery disease. There were few hearts "too good to die."

Several factors might explain these findings. Better prevention and treatment of arrhythmias has notably reduced deaths due to electrical instability. The spin-off from the coronary care unit into many areas has led to generally improved treatment of the acute phase of myocardial infarction. In recent years, good-quality cine-arteriography and open heart surgery have begun to have their impact. Aorto-coronary saphenous vein bypass graft surgery appears to have at least short-term benefits, and can be done in community hospitals with an operative mortality of 2 per cent or less.¹² Surgical treatment of ventricular aneurysm and akinetic areas is quite helpful in selected cases.¹³ There is current in-

terest in aggressive medical and surgical intervention in the preinfarction syndrome, in the hope that myocardial damage can be prevented or limited. In essence, patients with some functional myocardial reserve are being salvaged, at least for a time. Those with poorer left ventricular function continue to have a high mortality rate and constitute the largest group seen at autopsy. Patients with structural complications are a subset of this group.

Cardiac rupture does not offer much hope for treatment. Biorck⁶ and Mogensen⁷ have emphasized the importance of marked sinus or junctional bradycardia and electro-mechanical dissociation as EKG signs of bleeding into the pericardial space. Cobbs, *et al.*¹⁴ believe that when these signs are present in patients with pain and deteriorating hemodynamics, closed-chest cardiac massage should be avoided. Instead, they recommend pericardiocentesis and immediate surgical intervention. Their two cases are the first long-term survivors to be reported. The prognosis in this condition remains grave. All of our cases expired within two hours.

Septal perforation and papillary muscle rupture offer more hope for surgical treatment. These conditions must first be differentiated. This can be done by right heart catheterization alone, but left heart catheterization should also be done if the patient's condition permits.

Sanders, *et al.*⁸ reviewed the natural history of IV septal perforation and found that less than 35 per cent survived two weeks. The first attempts at surgical closure were in this group. Best results are obtained if the patient can be operated at six weeks or more.¹⁵ Unfortunately, few survive this long on medical management alone. Successful early operation has been reported only recently. Graham, *et al.*¹⁶ operated 12 cases from one to seven days after appearance of a ventricular septal defect (VSD), with six surviving from 6 to 54

TABLE V
RUPTURED PAPILLARY MUSCLE

Case	Peak SGOT	Peak LDH	Heart Weight	Coronary Arteries			Pathology	EKG Findings
				RCA %	LAD %	LCX %		
A-36-71	144	900	435 gm	100	90	100	Acute infarction of posterior L.V. wall with necrosis of left postero-medial papillary muscle and rupture from septal attachment	Q in II, III, AVF Tall R waves in V ₁ -V ₃

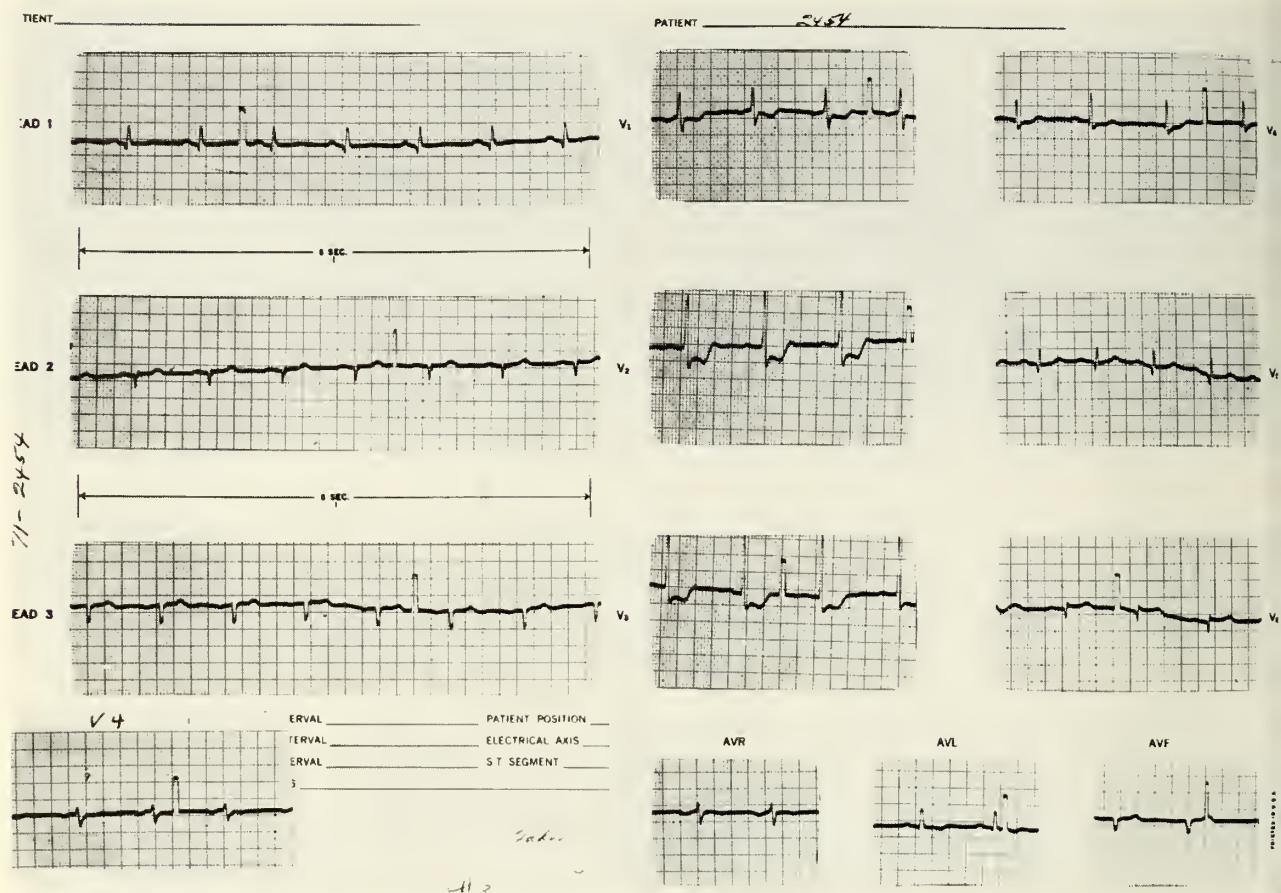


Figure 5. A-36-71.

months. Only one of our cases survived as long as four days and might have been a surgical candidate. At autopsy, his heart showed extensive left ventricular damage with severe three-vessel disease. Nevertheless, it is probably true, that patients who develop a murmur and heart failure after an infarction and are still alive at 24 hours deserve at least a catheter study. Even though the prognosis is poor, some patients in this group can be salvaged.

Ruptured papillary muscle has a higher medical mortality, with 70 per cent dead within 24 hours.¹⁰ However, Austen, *et al.*¹⁷ reported five cases in which valve replacement was carried out from 14 days to 14 months after infarction. Four of his cases survived.

Conclusions

While other complications of myocardial infarction are yielding to advances in medical and surgical treatment, the mortality from structural complications remains high, and in our institution constituted an in-



Figure 6

creasing percentage of infarct deaths over the period studied (*Table I*).

Cardiac rupture was most common (10.4%). It tended to occur in older females without previous coronary disease experiencing an antero-septal or antero-lateral infarction. Demise was rapid in all cases.

Perforated IV septum and ruptured papillary muscle accounted for 6.3 per cent and 2.1 per cent respectively. These conditions must be differentiated by catheter study, which should be done in patients who survive for 24 hours or more.

Acknowledgement

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Pseudomonas Tracheobronchitis

The Use of Systemic Gentamicin and Polymyxin-B Aerosol

LAWRENCE M. LAMPTON, M.D., WILLIAM E. RUTH, M.D., F.A.C.P. and
GERALD R. KERBY, M.D., F.A.C.P., Kansas City, Kansas

THE DISCOVERY of the penicillins in the early 1940s supplied a therapeutic modality for the gram-positive pneumonias. However, these same agents allowed an emergence of gram-negative organisms in the tracheobronchial flora.

The discovery of the polymyxins in 1947 provided a therapeutic modality for the gram-negative organisms, especially the poor-prognosis Pseudomonas pneumonia.¹ Neurologic and nephrogenic toxicities were soon recognized in patients with poor renal function receiving polymyxin-B systemically. Thus, this antibiotic was often used only after definite bacteriologic confirmation was made, and often rather late in the clinical course of Pseudomonas infections.

Lepper,² in 1954, described the use of aerosolized polymyxin-B as a prophylactic measure in patients with impaired respiratory clearance mechanisms, namely the postoperative patient or the neurogenically impaired patient requiring continued and prolonged intubation. His studies were primarily directed at the incidence and occurrence of various organisms in the previously sterile trachea, when various combinations of therapy were employed.

Subsequently, others have quoted his data as justification for the empiric use of aerosolized polymyxin-B as a therapeutic agent in combination with other potentially toxic agents in the treatment of Pseudomonas infection of the lung. Even though this therapy has been recommended and frequently used, there appears to have been no prospective study made where significant improvement was documented by objective criteria.

The discovery of gentamicin in 1962 provided an antimicrobial agent with gram-positive and gram-negative spectra, especially effective against *Proteus* and *Pseudomonas*.³ It rapidly gained popularity as the drug of choice in gram-negative infections because of its lower renal toxicity and high renal clearance. There has been, however, little change in the incidence of *Pseudomonas* infections or in the morbidity and mortality associated

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Address Reprint Orders to: W. E. Ruth, M.D., Department of Medicine, KUMC, Kansas City, Kansas 66103.

with *Pseudomonas* pneumonias. There have been several prospective studies reporting the benefits and the lack of benefits of gentamicin alone and in combination with other agents.^{4,5} Recent data, revealing that gentamicin does not enter the sputum in significant quantities to reach the minimum inhibitory concentration,⁶ have led to the reconsideration of use of intrabronchial polymyxin-B in combination with systemic gentamicin to con-

The therapeutic effect of systemic gentamicin and the possible synergistic effect of aerosolized polymyxin-B on *Pseudomonas* tracheobronchitis is evaluated.

trol *Pseudomonas* infections. Retrospective studies have reported both favorable and unfavorable results regarding the ability to eradicate *Pseudomonas* with the recommended dosages of aerosolized polymyxin-B.⁷⁻¹⁰ Case reports have been more concerned with the method of polymyxin-B delivery, and the pharmacokinetics of intrabronchial drug, than with the effect on the bacterial species or upon their quantitation. It has also been noted that serum gentamicin levels may vary widely in patients with normal renal function when the dose is calculated on a body-weight basis.

Currently, systemic gentamicin or carbinicillin are recommended for *Pseudomonas* pneumonia. This combination is of limited usefulness for prolonged therapy because of the required systemic route of administration, toxicity, and cost. These facts may have contributed to the recent emergence of *Pseudomonas* organisms resistant to these antibiotics.^{11, 12}

Because of these problems, we decided to evaluate the therapeutic effect of systemic gentamicin and the possible synergistic effect of aerosolized polymyxin-B on *Pseudomonas* tracheobronchitis. It has been demonstrated that less than 10 per cent of the intrabronchially administered Polymyxin-B is absorbed, and that the mean inhibitory concentration for *Pseudomonas* of 2 mcg/mm is easily achieved in the sputum by aerosolization.^{2, 7}

It was our previous observation that it was difficult

to eradicate *Pseudomonas* in patients with chronic pulmonary disease, thus quantitative cultures were used to objectively measure a therapeutic response. *Pseudomonas* pulmonary infection was defined as a patient having a positive quantitative sputum culture associated with any two of the following: (1) purulent sputum; (2) systemic leukocytosis; (3) fever; (4) x-ray worsening; (5) deteriorating clinical condition.

All patients were already hospitalized and under treatment for pulmonary decompensation, receiving vigorous tracheobronchial hygiene which included humidification, bronchodilators, intermittent positive-pressure breathing, postural drainage and clapping, and any other indicated drug therapy.

Seventeen patients with routine laboratory cultures positive for *Pseudomonas* were evaluated. After careful sputum collection and microscopic confirmation of its bronchial origin, ten patients had positive quantitative cultures. It is thought that the seven patients with unconfirmed positive cultures probably had gram-negative colonization of the mouth and throat, and the routine collection may have not been true sputum. It is also possible that a delay between collection and plating may have allowed an overgrowth of *Pseudomonas*. Ultimately, eight of these patients completed the entire course of therapy. One cystic fibrosis patient died of sepsis on the third day of gentamicin therapy; and one patient with bronchogenic carcinoma was withdrawn because of severe bronchospasm associated with aerosolized polymyxin-B therapy.

The average age of patients studied was 45 years, with an age range of 9 to 70 years. There was an equal distribution of the sexes, with five males and five females.

In the ten patients studied, the underlying diseases associated with *Pseudomonas* infection were cystic fibrosis in three and chronic obstructive pulmonary disease in seven. On entering the study, each patient received systemic gentamicin of 5 mg/kg/day in three equally divided doses (*Figure 1*) for seven days in the recommended dosage for *Pseudomonas* pneumonia, with the goal of reaching a known minimum inhibitory

concentration (MIC) for *Pseudomonas* of 6 to 8 mcg/mm. On the eighth day, aerosolized polymyxin-B was added in a recommended dosage of 2 mg/kg/day in four equally divided doses, which is known to achieve the MIC of 2 mcg/mm in the sputum. The antibiotic combination was continued throughout the 15th day. The patients were evaluated daily with sputum assessment for volume, consistency and color; twice daily their peak flow was obtained as a measure of airway dynamics; and weekly microscopic sputum examinations, quantitative cultures, creatinine clearances, gentamicin levels and gentamicin half lives were determined.

Serum gentamicin levels were measured and the drug half life and mean therapeutic level were calculated. The drug half life is the time required for the serum level to fall to 50 per cent of its peak concentration. The mean therapeutic level is the serum level at 50 per cent of peak concentration. It was determined that these patients, who were receiving the recommended daily dosage on a body-weight basis, had a mean serum half life of 4.2 hours. There was a wide variation ranging between 1.1 and 6.3 hours. The mean therapeutic level was 3.1 mcg/mm. Again there was a wide variability in the mean therapeutic level ranging between 0.8 mcg/mm and 4.2 mcg/mm. These levels paralleled the half lives as would be expected.

It should be noted that these levels did not approach the minimum inhibitory concentration for *Pseudomonas* infection of 6 to 8 mcg/mm. The toxic level for gentamicin is greater than 12 mcg/mm.

Figure 2 demonstrates the results of the quantitative cultures. The sputum collections were obtained more than five hours after the last dose of aerosolized polymyxin-B. It should be noted that the divisions on the ordinate are not linear; instead, each division is a tenfold increase in number of colonies per millimeter. Each bar represents a single culture, and each type of bar a different phase of the therapeutic course as indicated. Comparing the baseline cultures to the cultures after seven days of gentamicin therapy, one can see that there was little or no change in the quantitative cultures. Patients 3, 5, and 8 did have a decrease in the number of organisms, and these same patients had gentamicin therapeutic levels at 4 mcg/mm. This implies that the serum concentration was within the MIC range approximately 20 per cent of the time, and may have contributed to the suppression of the number of organisms. During therapy with gentamicin alone, there was no change in the patient's sputum consistency, volume, color, nor in their peak flow rates.

With the addition of polymyxin-B aerosol, it is evident that six out of eight patients had a complete aboli-

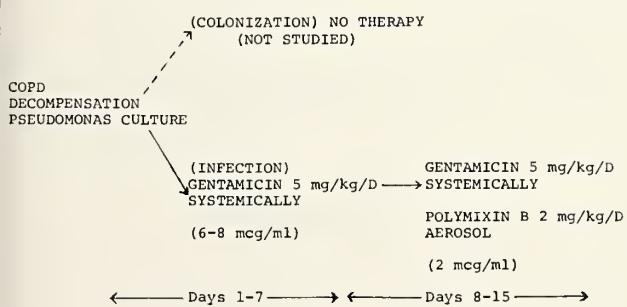


Figure 1. Antibiotic study design.

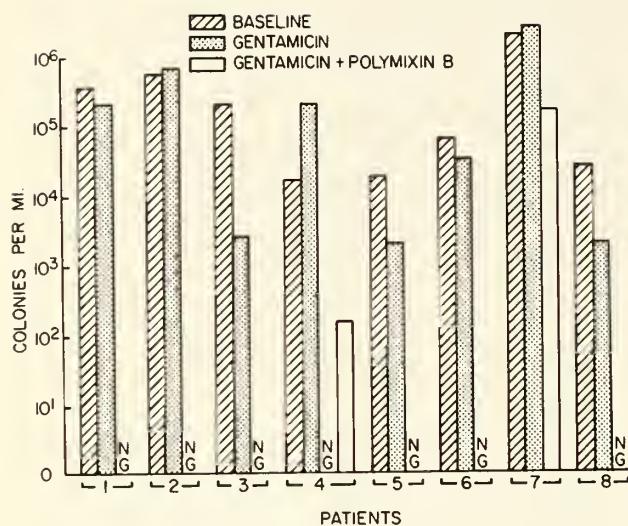


Figure 2. Quantitative culture results.

tion of organisms. Patient 4, with a left-upper lobe abscess, had no growth on one culture and a diminished number of organisms on a sample the next day, presumably as the abscess partially drained. Patient 7, with cystic fibrosis, had no significant change in the quantitative cultures. This patient also had the shortest gentamicin half life and the lowest gentamicin level at 0.8 mcg/mm. Associated with the abolition of organisms in the sputum, two of six patients had a decrease in the volume and consistency of their sputum; and four of six had an improvement in the sputum color and in their peak flows.

Summary

We found that in *Pseudomonas* respiratory infections, systemic gentamicin alone, in recommended doses by body-weight, may not decrease the number of organisms in the sputum. This may be related to the inability to achieve the 6 mcg/mm concentration required for the inhibition of *Pseudomonas*. It also may be related to the poor sputum penetration by systemically administered gentamicin. It is thought that the combination of systemic gentamicin and polymyxin-B aerosol may produce an additive or synergistic effect in *Pseudomonas* tracheobronchitis. Reduction in the number of organisms by combined antibiotic therapy did not alter sputum volume nor sputum consistency in the majority of patients, but did improve sputum color and airway dynamics. On the basis of this preliminary data, it is suggested that when treating *Pseudomonas* respiratory infection with gentamicin, the dosage should be determined by the serum gentamicin level. In order to determine the optimal therapy for *Pseudomonas* respiratory infection, further studies will

be needed in which the gentamicin blood level is controlled at the minimum inhibitory concentration, and patients are randomized using each antibiotic alone as well as in combination. Long-term followup after these various modes of therapy should be done to establish whether or not a prolonged therapeutic benefit is obtained.

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Chest Pain and Angiography

Normal Coronary Arteriography

**ARVIN ARTHUR, M.D., Wichita,
J. MICHAEL KIOSCHES, M.D., Iowa City, Iowa, and
LOTFY L. BASTA, M.D., Oklahoma City, Oklahoma**

NORMAL CORONARY arteriography is not uncommon in patients undergoing cardiac catheterization for evaluation of chest pain. Large centers report that patients in whom primary myocardial disease, valvular heart disease, congenital heart disease and systemic diseases known to cause angina pectoris have been excluded, 9 to 30 per cent will have normal coronary arteriography.¹⁻³ We have been reassured by these reports that the prognosis is benign and that most patients improve with no treatment. In addition, most studies imply that, in the absence of large-vessel disease demonstrated by angiography, reassurance to the patient and his physician is sufficient in most cases. There has been little information as to how many of these patients continue to have chest pain, require medication for their chest pain, or need to be rehospitalized because of their chest pain.

Patients Studied

In a retrospective study covering the years 1967-1971, 39 patients undergoing cardiac catheterization for angina-like chest pain were found to have normal coronary arteriograms. All patients with abnormal coronary angiography, primary myocardial diseases, and other diseases known to possibly cause angina pectoris were excluded.

Of the 39 patients, four were lost to follow-up. One died in an automobile accident, and three moved out of state and could not be contacted. The remaining 35 patients were followed for two to six years. Of these, 21 were male and 14 female.

In agreement with other reports, no patients had a myocardial infarction and none died. Surprisingly, 32 of 35 continued to have chest pain. Six patients had chest pain but did not require medication or hospitalization. Twenty-six required medical treatment and 14 of these were hospitalized for chest pain.

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Address Reprint Orders to: Arvin Arthur, M.D., 1035 N. Emporia, Wichita, Kansas 67214.

An attempt was made to correlate the electrocardiograms with the clinical course at rest and with exercise (Table I). There was no correlation.

The functional classification of the majority of these patients was I-II, and did not change significantly during the study.

Discussion

Several explanations for angina-like chest pain and normal coronary arteriograms have been proposed. Abnormal hemoglobin-oxygen dissociation has been one explanation, especially in heavy smokers.⁴ This has been discounted by recent studies, which have shown normal myocardial oxygen extraction in patients with normal coronary arteries and angina even with atrial pacing, tachycardia, or isoproterenol infusions.⁵ Small-vessel disease should be considered in collagen vascular diseases, diabetes, polycythemia, thrombotic thrombocytopenia, and certain neuromuscular diseases. In the absence of these diseases and the absence of large-vessel atherosomatous disease, small-vessel disease can be discounted as a cause of angina-like chest pain.

Undetected cardiomyopathy of the asymmetric septal hypertrophic type (IHSS or ASH) is a known cause of angina-like chest pain. A family history and the physical examination should suggest this disease, and an echocardiogram and adequate cardiac catheterization should exclude it. Inadequate coronary arteriography occasionally leads to the diagnosis of a normal coronary arteriogram. When performed at large centers with experienced arteriographers and good equipment, this should be an infrequent occurrence. Coronary artery spasm has been demonstrated to occur in some patients during coronary arteriography and has even recently been described in some cases of Variant or Prinzmetal's angina.⁵ All of these possible causes were thought to be absent in the present study.

Two aspects of this study deserve comment. First, there is a majority of males in this study, whereas in most other reports females predominate. It should be pointed out that there is one large series in which the ratio was equal.⁶ Second, since this was a retrospective

TABLE I
ELECTROCARDIOGRAPHY AND SUBSEQUENT CLINICAL COURSE

	Total No. Patients	Exercise Test		Not Exercised	Abnormal Resting ECG
		+	-		
No treatment	9	4	3	0	2
Medication only	12	3	7	1	1
Hospitalization only	1	0	1	0	0
Hospitalization plus medication	13	3	6	2	2

study, it is possible that with atrial pacing, coronary sinus lactate measurements or LVEDP with exercise, further myocardial abnormalities might have been found in some cases.

Summary

In summary, patients with angina-like chest pain and normal coronary arteriography have a good prognosis. The clinical course cannot be predicted by ECG changes at rest or with exercise. The majority are able to continue to perform at an exercise level equivalent to functional class I-II for at least two to six years. Unfortunately, the majority of these patients continue to have chest pain and require medical treatment despite the assurance of a normal coronary arteriogram. A sig-

nificant number will even require hospitalization for chest pain.

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Fasting Hypoglycemia

Diazoxide as a Test for Endogenous Insulin Release

G. W. HUNNINGHAKE, M.D., J. H. HIGUCHI, M.D., and
J. L. KYNER, M.D., Kansas City, Kansas

FASTING HYPOGLYCEMIAS are characterized by symptoms which occur in the morning or after a period of fasting, and reactive hypoglycemia occurs several hours after eating. The reactive forms of hypoglycemia can usually be diagnosed on the basis of the clinical history and glucose tolerance testing. They will not be the subject of further discussion in this paper. When a patient presents with a history compatible with hypoglycemia, the most important step, after documenting the hypoglycemia, is to decide whether this is a fasting or a reactive type of hypoglycemia.

There are multiple causes for fasting hypoglycemia, as is seen in *Table I*. Congenital enzyme defects are usually seen in the pediatric age group, and therefore are rare as the cause for the first hypoglycemia in the adult. Hypoglycemia associated with severe hepatocellular damage will almost always be related to the very apparent underlying liver disease. Ethanol can cause a severe form of hypoglycemia which should always be considered in an alcoholic with altered mentation or other acute neurological abnormalities.^{1, 2} Patients with adrenal or pituitary insufficiency are very sensitive to insulin and may, at times, have a low blood sugar level.³ Exogenous insulin or drugs are the most common causes of significant hypoglycemia, and they should always be considered in someone who has access to these medications. Massive extrapancreatic neoplasms can lower blood glucose by rapid utilization of glucose by the tumor, or by producing an insulin-like substance which can lower blood glucose.⁴

The presence of an insulinoma in a symptomatic patient is frequently missed for long periods of time because of its varied modes of presentation, slow tumor growth, and the difficulty in establishing a diagnosis by laboratory means. The tests which have been used pre-operatively to establish the presence of an insulin-

secreting tumor are listed in *Table II*. Prolonged fasting of up to 72 hours is frequently the most useful means of triggering hypoglycemia in these patients. Most patients with an insulinoma will become symptomatic, with low blood sugar after 18 to 24 hours of fasting. The test should be continued for at least 48 hours, however, before it is considered negative. Along with regular blood sugars, serum insulin levels should be routinely obtained in such patients.

Testing for inappropriate insulin release in a hypoglycemia work-up often depends upon making the patient hypoglycemic. The use of a single dose of diazoxide in a patient shown to have an insulinoma is described.

The glucose tolerance test is of limited value in the patient with a possible insulinoma. However, some of these patients will respond to the glucose challenge with a marked hypoglycemia in the third and fourth hours of the test, which does not return to baseline value by the sixth hour. Patients with reactive hypoglycemia similarly become hypoglycemic several hours after a glucose load, but their blood sugar levels are usually normal by six hours.

The fish-insulin-induced hypoglycemia test involves giving the patient an exogenous form of insulin which is not detected by radioimmunoassay.⁵ Normally, endogenous insulin is suppressed by exogenous insulin. Endogenous insulin release from an insulin secreting tumor is not suppressed in this manner. The tolbutamide, leucine, and glucagon tests have also been used to trigger hypoglycemia in these patients.⁶⁻⁹ Because of the danger of life-threatening hypoglycemia that may be provoked by these agents, these tests must be done with caution. The diazoxide test, which will be discussed further, is the only one of these tests which does not make the patient hypoglycemic and, therefore, is potentially the safest.

Diazoxide, a benzothiadiazine analogue, was originally introduced as an antihypertensive agent.^{10, 11}

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Address reprint requests to: J. L. Kyner, M.D., Dept. of Internal Medicine, KUMC, Kansas City, Kansas 66103.

TABLE I
HYPOGLYCEMIA

Fasting

1. Islet cell tumor (insulinoma)
2. Massive extrapancreatic neoplasms
3. Hepatic causes
 - 1) Acquired: Severe hepatocellular damage
 - 2) Congenital enzyme defects
4. Ethanol and poor nutrition
5. Endocrine (adrenal or pituitary insufficiency)
6. Exogenous insulin or drugs

Reactive

1. Functional
2. Early diabetes
3. Dumping syndrome

Nevertheless, it was quickly shown to possess appreciable hyperglycemic properties and, since 1963, it has found an increasing use in the treatment of hypoglycemias.^{12, 13} The two principal merits of diazoxide in treating these cases are its effectiveness in combating hypoglycemias of a wide variety of causes and the ready reversibility of its effects with cessation of the drug.

There has been controversy concerning the mode of action of diazoxide. It may be effective in at least three possible ways in raising the blood sugar level. First, diazoxide has a direct effect on the beta cells to reduce insulin secretion due to glucose and amino acid stimulation.¹⁴⁻¹⁶ This effect is seen in both normal and neoplastic islets, and usually results in definite lowering of blood insulin levels. This action on the pancreatic beta cells can be overcome by the administration of tolbutamide.

Second, diazoxide increases catecholamine release,¹² and its effectiveness is known to be reduced after adrenalectomy. The resulting raised levels of circulating catecholamines may also be expected to reinforce the direct effects of diazoxide on insulin secretion, and may also account for the observed rise of serum levels of free fatty acids.

Finally, diazoxide may directly act on the liver to increase its rate of glucose output. The effects of diazoxide seen in normal people may result from the complex interactions of the effect at all three sites with the inhibition of insulin secretion being predominant.

The use of diazoxide in the diagnosis of insulinomas was first described by Schein,¹⁸ at the National Institutes of Health. Their patients were given 100 mg of oral diazoxide every eight hours for several days, and blood sugar readings were obtained daily. They felt

TABLE II
TESTS FOR INSULIN-SECRETING TUMORS

- | | |
|-----------------------------------|--|
| I. Suppression Tests | |
| Prolonged Fasting | |
| OGTT (later hours of test) | |
| Ethanol-Induced Hypoglycemia | |
| Fish-Insulin-Induced Hypoglycemia | |
| Diazoxide | |
| II. Stimulatory Tests | |
| Tolbutamide | |
| Leucine | |
| Glucagon | |

that a greater than 50 per cent increase in the basal blood sugar values over two to three days was diagnostic of an insulinoma.

Based on these studies, we utilized diazoxide as part of a hypoglycemic work-up in a patient with documented fasting blood sugars below 30 mg/100 ml. However, in contrast to the method described above, we gave the diazoxide as a single dose preceding a standard oral glucose tolerance test.

Case Report

The patient first presented to the University of Kansas Medical Center in 1965. At that time she was 48 years old, and had a 16-month history of blackout spells and focal neurological signs. Her physical examination was normal and all laboratory data, including cerebral arteriography, were within normal limits. Her symptoms continued unchanged until 1973, at which time she noted periods of disassociation, weakness and cold skin, in addition to the above problems. A blood sugar sample drawn during one of these attacks was 25 mg/100 ml. She had noted that frequent eating decreased the frequency of these episodes.

She was subsequently hospitalized, and blood sugar reading following 22 hours of fasting measured 31 mg/100 ml. A glucose tolerance test was then done, followed on the next day by a repeat glucose tolerance test. Two hours before this second test, 300 mg of diazoxide was given to the patient orally. The results of these tests are seen in *Figure 1*. During the initial glucose tolerance test without diazoxide there was hypoglycemia by the fourth hour, which persisted to the end of the test. Inappropriate elevations of plasma insulin level during this period of hypoglycemia were also observed. Prior to the second oral glucose tolerance test, the patient had the expected decrease in her plasma insulin level within 15 minutes following diazoxide administration. With this test, there was an appropriate

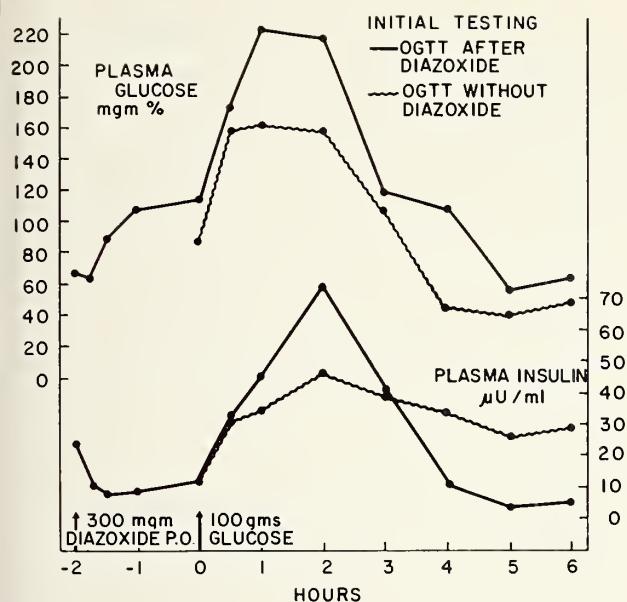


Figure 1

insulin response to the hyperglycemia following the glucose load. Importantly, during the later hours of the test, when the blood glucose levels fall, there was a simultaneous, appropriate decrease in her plasma insulin level.

Based on these studies, it was felt that the patient did have an inappropriate endogenous release of insulin causing her hypoglycemia, and should be surgically explored. At the time of surgery, a 1 cm insulinoma was found in the head of the pancreas and removed. Following surgery, the patient had no further episodes of hypoglycemia.

Two months after surgery, the patient was again rehospitalized and the two glucose tolerance tests were repeated as before surgery. *Figure 2* contrasts her standard oral glucose tolerance tests without diazoxide both before and after surgery. The postoperative test is entirely normal in contrast to the previously described abnormal test prior to surgery. *Figure 3* shows the glucose tolerance tests done with preceding diazoxide. In both tests, there is an initial decrease in plasma insulin levels following the administration of diazoxide and the expected increase in plasma insulin levels in response to a glucose challenge. It is important to note that in each test with diazoxide, there was an appropriate fall in plasma insulin levels in response to decreasing blood sugar levels in the later hours of the test. Diazoxide appeared to suppress "inappropriate" insulin release more readily than "normal-islet" insulin release.

Proinsulin levels were not determined in our patient. These would have been of interest since elevations have been noted in patients with insulinomas,¹⁹⁻²² al-

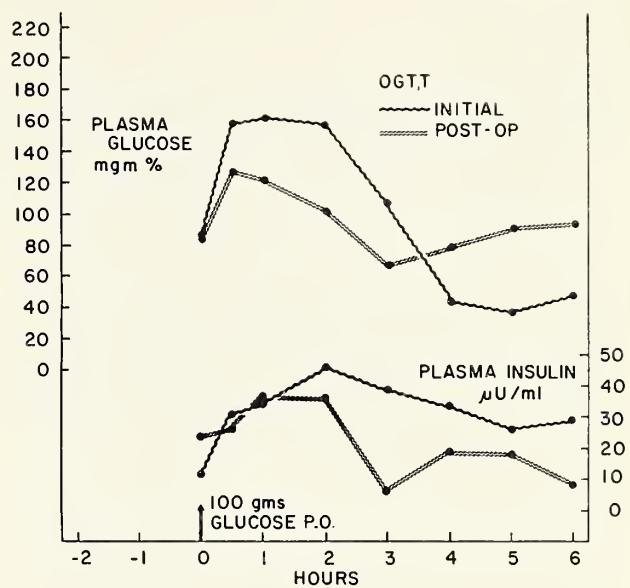


Figure 2

though diazoxide has been reported to suppress immunoreactive insulin more readily than measured proinsulin. The effect on the inappropriate insulin release may have been to retard proinsulin and allow more normal insulin to be released.

The diazoxide test, as described above, was a quick and safe adjunct as to whether the patient's fasting hypoglycemia was secondary to endogenous insulin release. The diazoxide response was seen after one oral dose, and patients probably need not be given a loading dose or repeated doses for its effect. This normalization of the insulin response to plasma glucose levels

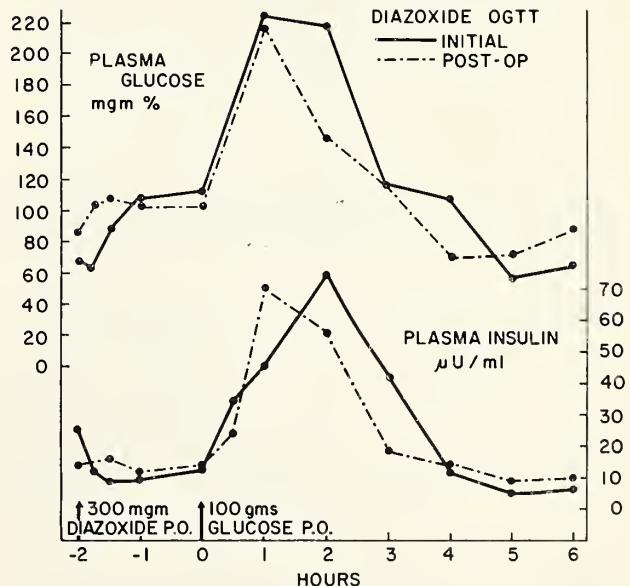


Figure 3

is probably secondary to suppression of inappropriate insulin release.

This response to diazoxide, and its utilization as a differential test in a patient with apparent inappropriate, endogenous hyperinsulinemia, represents only one case and, therefore, cannot be generally recommended until more cases are studied and further data collected. It would appear to be a safe procedure and no more involved than other types of testing in unexplained hypoglycemia. By whatever methods of evaluation, an inappropriate plasma insulin/plasma glucose ratio remains the most definitive piece of readily available evidence at this time for the presence of an insulin secreting tumor.

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116th KMS ANNUAL SESSION

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Pediatric Psychiatry

Psychiatric Consultation in the Pediatrician's Office

HARCHARAN S. SEHDEV,* M.D., Topeka

THE DEVELOPMENT of easily accessible psychiatric services for children is one of the urgent priorities in the mental health system.¹ Sparsely scattered and often inadequately staffed community clinics, while laboring hard, fail to serve all those who seek help. Private clinics, on the other hand, are too few and usually too expensive to afford care for any appreciable segment of the population. In the meantime, many emotionally ill and disturbed children continue their existence without the benefit of professional opinion, risking further deterioration or settlement in a state of chronic disability or discomfort. In order to provide for the current demands for services and to prepare for the projected needs, it is imperative that the expansion of services not only be emphasized but that innovative methods be evolved for making professional help readily available to as many as possible. This paper describes one such approach. It discusses the provision for psychiatric consultation in the pediatrician's office.

The overall objectives for this paper are threefold: (1) to demonstrate, through a small series of case presentations, the wide variety of psychopathology that a pediatrician encounters in his office practice; (2) to highlight some of the common features of collaborative pediatric/child psychiatric practice; and (3) to describe an approach in rendering help directly and with dispatch to the family. In this respect the emphasis remains on using parents as a means of ministering help to their child. Where this was considered to be an unrealistic goal, the approach was used to prepare the family for receiving further psychiatric help.

Lessening of general stress in the family and removal of symptoms were considered achievable and worthy goals. This was based on the expectation that removal of obvious impediments would permit natural resumption of growth in the child. The approach described to achieve this is not synonymous with "advice giving," and it does not deal in depth with parental intrapsychic

conflicts. However, it does juxtapose those salient intrafamily or parent-child struggles which may create a deadlock and impede further growth in the child. Such juxtaposition usually evokes parental empathy with the resultant new or different awareness about a child's difficulties. Under these circumstances, parents often show remarkable capacity for devising new ways of handling and responding to the child. Lessening of irrational

The consultative mode is described, stressing a shift in orientation to view the psychiatrist as part of the team providing total health care.

feelings about their own role in the child's difficulties permits more effective parenting, a necessary ingredient and perhaps the first step toward the restoration of health and growth.

Setting

Two groups of pediatricians, one in a military based hospital and another in group practice, participated in the program. The psychiatrist visited their offices for consultations. With some preparation, which was usually not extensive, the pediatrician would refer the patient for a consultation "with the psychiatrist in our office." The patients were seen within a few days.

In the consultation, the child and the mother or both parents were seen. Individual or joint interviews were held with the child and the parent(s) as indicated. As a rule, the final recommendations were always presented in the joint meeting, yet leaving time for discussions with the parent separately if that seemed desirable.

Following the consultation, the referring pediatrician and the consultant met to further discuss between themselves the findings and the recommendations. During this meeting, plans for followup were evolved; and in addition, these meetings served as a format for discussion of related topics.

Case Histories

Case 1. An 11-year-old boy, third of five children from a lower middle-class family, came for consultation

* Director, Children's Division, The Menninger Foundation, Topeka, Kansas 66606.

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Address reprint requests to: H. S. Sehdev, M.D., Box 829, Topeka, Kansas 66601.

accompanied by his mother. This was a second marriage for both parents; the child was from the mother's first marriage. Considerable marital discord existed in the parents' current marriage with their mutual awareness that they had difficulty in accepting the children from each other's previous marriages. This boy had always been enuretic but had recently begun to soil. He was well-oriented in all spheres, and his thinking was coherent. He had many guilt feelings, was easily prone to cry during the interview, and the mother reported that he would frequently throw temper tantrums at home.

The consultant, having arrived at a preliminary diagnostic formulation in the context of the family structure, now commented: "It seems that things have been rough for everyone in the family for some time." He inquired as to the understanding the mother had of the boy's crying episodes and how she usually handled these. The mother began somewhat hesitantly and stated that she usually felt angry and helpless when he cried, and continued: "My first marriage was terrible. We had difficulties in accepting each other's children from our previous marriages, and difficulties with the boy make it harder. I wanted to make this marriage work better." Mother continued in this vein for some time, and having vented her feelings, described her handling of the boy during these episodes. This consisted of usually a reprimand, sending him to his room, or threatening withdrawal of privileges. This made matters worse. The consultant empathically commented on the mother's fearful feelings about her marriage and wondered if she had any thoughts as to what the child might also be experiencing. The mother seemed somewhat surprised and stated that she had not thought of it that way. However, she continued to talk about the boy missing his father and how he had cried following parental divorce; and after a pause, "Do you think he feels responsible for it?" The mother seemed to have become aware that the child must have been troubled for quite some time. A followup visit was set in which the boy's stepfather also participated. Both parents talked about their own marital difficulties and feelings of failure in their second marriage, but seemed to be determined to work on their problems. However, these two sessions were enough for them to move to a point where they could accept psychiatric help for the child.

Case 2. An 11-year-old girl was third of four children of an elderly couple from a low socio-economic background. The mother had initially consulted the pediatrician because of her concerns about the girl's "withdrawal, daydreaming, and lack of energy." The pediatrician was not overly concerned, but wanted a second opinion to rule out possible emotional illness in

the girl. In the interview, the child appeared mildly inhibited, somewhat sad, but alert and coherent. She was much smaller than average in build, and had suffered from congenital hip dislocation which affected her gait. Her only sister was much older and had been a mother surrogate. She married two years ago, and a few months before the consultation the sister had given birth to a girl. The child was upset by this event and seemed to experience this as a loss, as if the sister was lost the second time to the newborn. Forthcoming puberty caused concerns both for the girl and her elderly mother, who found it difficult to impart the facts of life to her child.

When the consultant asked the mother what made it difficult for her to impart this information, she stated: "I thought our family was complete before [the girl] was born. I think I have always felt uneasy and somewhat ashamed for having [her] after all the kids were grown up. When I was growing up, kids just grew up and there was no sex education. I guess in a way I wish I could be a grandmother rather than a mother to [her]." The consultant acknowledged the great burden the mother felt in raising the child. He also focused on the girl's reactions to the sister's marriage and now the birth of an offspring. As the mother explored her own awkward feelings in supporting her young daughter through this stressful period, she began to think of ways of eliciting support and assistance for her. She continued that her older daughter was a registered nurse and had a close relationship with the younger sister. The consultant continued to see the daughter and the mother every two weeks for a six-week period. At the same time the older daughter began to enlighten the young girl. The consultant focused mainly on the interaction between the daughter and mother, facilitating the dialogue, and focusing on their shared anxiety about the girl's growing up. After three visits, it seemed that the child was sensing a great deal of support from her mother and her older sister. In the six-month followup through the pediatrician, it was reported that she seemed happier, was adjusting better to school, and had made a few friends.

Case 3. A 10-year-old girl was the first of three siblings living with her father and stepmother. The father was a merchant of middle class standing and the mother a young housewife with two children, age 3 and 1, from her present marriage. The stepmother, a plain-looking, somewhat plump woman, seemed at times overwhelmed with guilt feelings mixed with her anger toward the girl. She wanted her to be happy, and yet resented the attention and the care she demanded. In the first eight years of life, the girl lived with her natural mother in chaotic circumstances. A series of trau-

matic events occurred, culminating in desertion by her natural mother, whereupon the father received the girl's custody. There were indications that the child received physical abuse frequently during the period of her stay with her natural mother. A neurologist, suspecting petit mal, placed her on appropriate medication. However, little improvement was noted. In the interview, the girl appeared as a pale complexioned, clumsy girl with numerous bruises over her legs. She was silly, awkward, incoherent, and concrete with stereotypic manners. These findings suggested presence of serious psychopathology. The task for the consultant was to help the family become aware of the girl's serious problems and to help the family accept recommendations for a comprehensive evaluation and treatment through an appropriate agency.

Case 4. An 8-year-old boy was the first of two siblings from a lower middle-class family. His father was a skilled worker. The chief complaint was stuttering and poor school performance. The boy had been previously examined for speech and hearing problems when the clinical impression was that his difficulties were primarily due to the existing family stress. His mother was a perfectionistic, but well-meaning person. His father, who was quite set in his manners, demanded obedience and permitted little verbal expression. The boy achieved various milestones at proper ages, and the toilet training was completed by the age of 2½ years without any problems. Both parents expected him to be a perfect boy, competent, assertive, and yet obedient. They felt that he had failed to live up to their expectations, which engendered feelings of despair and anger in the parents. In the individual session with the consultant, the boy related with ease, and displayed at least average intellect with logical thinking. Stuttering was rarely noted, and occurred only when matters evoking powerful affects were discussed. Assessing parental strengths as a favorable factor, it was decided to render help via the parents. During once-a-week meetings, the parents were invited to bring specific examples about the boy's troublesome behavior and their ways of handling it. The major task in these sessions was to point out the parental inconsistencies and their unrealistic expectations. These comments, however, were made empathically and usually brought forth the recollections from their own past with one or the other parent exclaiming, "I did that when I was small." Thinking how they had felt at that time, and what they wished their parents had done, evoked their empathy for the child. Concomitantly examining their own motives and modes of doing things, they began to deal with him differently. The predominant shifts occurred in their degree of tolerance, and enhanced consistency

in their handling of the boy without getting bogged down by their unrecognized conflicts which resonated with his.

Case 5. A 5-year-old boy was the second of three children of a skilled worker and his wife, a beautician. He was brought for consultation because he was afraid of strangers and reluctant to go to school. The mother was psychologically minded, articulate, albeit verbose and effervescent in her manner. The history was significant in that the boy went through a series of surgical interventions beginning at the age of six months for orthopedic corrections requiring tendon lengthening, casts, and braces. During these episodes, the mother reported that the child showed no overt emotion. She herself took these events in a matter-of-fact manner, as did her husband. In the consultation, the boy mumbled, did not speak with the examiner, but would whisper to his mother. He would, however, play with toys and scribble on paper. The impression based on his play was that he was an intelligent boy. Included in the recommendations was that the mother should clearly convey to the child that he will be entering school. The mother should engage in play when the opportunity naturally arose, to recognize and comment on the fear he had of both injury and strangers, and that he should be adequately prepared prior to further surgery in consultation with the pediatrician. In the followup visit the next week, the mother reported that she had introduced the game of peek-a-boo and had tried to gently convey to the boy her recognition of his fears. As these sessions proceeded, extremely rich material emerged regarding the child-rearing practices in the family. In order to raise her children in a modern way and "not as my mother raised me," the boy's mother wanted to impart liberal sex education. To accomplish this, the children and the parents bathed together, and mother provided stimulation encouraging the boy to handle her breasts as he pleased. She mentioned examples which indicated presence of anxiety in him. She was, of course, unaware of that and was determined to bring up the boy in a "modern" fashion.

The consultant consistently pointed out the element of anxiety in the boy, and later wondered about possible connections between his anxiety and many previous traumatic events as well as current practices at home.

Much discussion occurred about the possible perceptions of surgical operations as assault on him. His lack of protest against these interventions seemed indeed an anomalous reaction. Equally unassimilable may have been the exaggerated emphasis on sexual permissiveness to achieve enlightenment. The mother, in the course of discussions, realized how she had tried to refute her puritanical background, and the child seemed designat-

ed to vicariously carry out this refutation. After some venting of anger at her parents, the mother could now accept the recommendation of separate bathing and other sound child-rearing practices. She found it easier to play with the boy, and by the time the fourth session approached, he entered school. There was some reluctance to go to school, and the mother promised that she would stay in the principal's office if the boy wanted it. This was enough to reassure him, so that after a very short time that day he permitted the mother to leave the school.

Meanwhile, the boy continued to meet with the consultant in play therapy for a total of ten sessions. Part of the time was spent with the mother, usually in a joint session, where discussion about specific events of the week continued. In his play games of construction and destruction, smaller animals were being eaten up by bigger, more powerful animals. This play permitted enough working-through of traumatic life experiences for the boy to permit termination of the program after the tenth session.

Case 6. A 12-year-old girl was brought by the mother because of her concern about the girl's bitterness and rebellious attitude toward her. It became readily apparent that the mother had grave concerns regarding the girl's recent onset of puberty, which the mother considered somewhat precocious in onset. Mother had both covert and overt concerns that the girl would become sexually active and disgrace the mother. She wanted the girl to remain "pure for the man she would marry someday." The mother was divorced from the child's natural father when the girl was four. The mother remarried, and her second husband died about two years later. She then lived with another man in common-law. The latter arrangement ended a year later, and the mother continued to have casual relationships with men. The girl already felt "disgraced in front of my friends" because of the mother's life-style. The mother and daughter were interlocked in similar struggles which produced embarrassment, bitterness, and anger in both. The girl seemed to be paying an additional toll in unhappiness, mild depression, loss of peer relationships, and drop in her school performance. In the joint session, the focus was on mother-daughter interaction with their mutual fears based on similar reasons. The process seemed to show some promise but aborted after the second session.

Discussion

A series of brief case presentations illustrate the presence of a remarkably broad range of psychopathology in children seen in consultations. The diagnostic categories extended from mild adjustment reactions to seri-

ous psychotic illness. The intensity and chronicity of these disorders was surprisingly similar to that seen in a large psychiatric clinic. These observations verify the documented reports¹ citing the high prevalence of emotional disorders in children, poor case-finding methods, and deplorably inadequate mental health delivery system. Although this paper provides no answer to these complex issues, it hopefully adds to the efforts directed by others to meet these challenges. However, the consultative mode described in this paper calls for some shift in orientation. The psychiatrist functions as a medical colleague, rendering help with dispatch, and becomes a part of the team providing total health care. The patient usually experiences this as continuity in his care. The familiar setting in which the consultation occurs increases the patient's acceptance of psychiatric opinion, and the usual resistance is minimized. The initial preparation for the consultation occurs in discussion with the pediatrician, and although the preparation may require varying lengths of time, the patient is less likely to be lost in the shuffle. In some cases, judiciously employed physician authority in directing the patient toward initial consultation is helpful without the need for lengthy analysis of a patient's resistance. Furthermore, in the setting described, the pediatrician has the opportunity to discuss the problems related to initial preparation with the psychiatrist in their regularly occurring meetings. Likewise, the pediatrician becomes a resource person for psychiatric followup. In some cases, the pediatrician may choose to give counsel to the patient while the consultant assumes a supervisory role for the pediatric colleague, at the same time remaining available for direct intervention if the situation so demanded.

In addition to these clinical tasks, the two physicians were afforded a unique opportunity for mutual education. This was both a professionally rewarding and generally gratifying experience.^{2, 3} Following each of the consultation periods, the consultant and the pediatrician met regularly for discussion of cases. The cases seen in consultation that day provided a starting point for the discussions. However, the discussions were broadened to include general but related topics. With the passage of time, it became apparent that the pediatrician's acumen of psychiatric understanding had increased to such a degree that he could now employ it in a variety of ways while still practicing within the bounds of his specialty. He felt increased comfort in recommending psychiatric consultation, found it easier to deal with patients' initial anxiety about the consultations, and could assume at times direct counselling himself. He generally felt at ease in relating to young children in difficult situations. In the last respect one

pediatrician remarked, "I didn't know how to talk to a kid who didn't answer. I felt like saying, why bother me if you don't want to talk." In the course of time, the physician learned alternative ways to intervene. He could make empathic remarks which frequently yielded a positive response from the patient. The same physician was to subsequently remark, "I don't know how much psychiatry I have learned, but I feel, I am a better pediatrician because of the experience."

In terms of the conduct of the consultation proper, certain conceptualizations described by Morrow⁴ were incorporated. The initial diagnostic formulations were arrived at in the context of the family relationships and its dynamics. The comments to the parent(s) were selectively directed toward those areas where parental conflicts (personal or interpersonal) seemed resonant with that of the child and, therefore, created difficulties.

Parental responses to these interventions were variable and included denial, anger, fear, compliant acceptance, and the like. Frequently, some catharsis permitted more direct focus on the child's difficulties. This brought forth parental awareness of the child's problems. Every opportunity was availed to facilitate evocation or enhancement of parental empathy for the child. The consultant could now go to the discussion of specific examples in the family life which created difficulties for the child. At times, direct advice was given, although this was not considered to be a very useful approach. The reasons for this were that what might be suggested to the parents had either already been tried by them and discarded, or it sounded like "Dear Abby," or made the parents feel put down. In preference, however, the examination of specific events and the consultant's confrontation or asking for clarification jogged parental latent recognition of maladaptive interactions. Not only the role of parents, but also that of a child, in perpetuating and maintaining a state of disequilibrium, could be discussed. The crucial difference, however, was that the discussions were no longer based on accusations and counteraccusations, but rather on

the basis of mutual involvement and shared responsibility of the family.

One special problem, although uncommon, deserves mention. Strong parental transference (toward the consultant) sometimes emerged during the consultation. Transference during brief consultation periods or the followup was of little clinical usefulness, and was recognized but not discussed. However, when a persistent, strong transference could not be ignored, it was put to work. Often, the transference seemed to recapitulate parent-child relationships; the consultant juxtaposed parent-consultant transference and the real parent-child relationship. If data permitted, another parallel relationship, that of a parent and his or her parent could be similarly employed. Selective and proper use of this technique brought a striking awareness in parents about their own conflicts as well as those of the child. As they viewed their own relationship to their parent(s), evocative empathy for their own child resulted simultaneously. Their new outlook about the child's difficulties mobilized enough ego strengths to bring about their new ways of handling the old problems. The problem solving (symptom removal) was considered a worthy goal. The homeostasis⁵ thus achieved, it was felt, would permit ascendancy of innate growth-promoting forces.

The brief interactions with the patient and parents forestalled development of excessive dependence on the physician. Furthermore, it fitted with what a layman expects of visits to a physician; that is, receiving time-limited help to resolve specific problems.

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The President's Message

Today's headlines:

1. Medicare Is Good But Leaves Something to Be Desired.
2. Part I Plight of the Elderly: Aged Face Grim Outlook.
3. Louisville, Ky.: Ford Begs for Votes.
4. Youth: Whose Problems?
5. The Golden Years.

These are all headlines in the mail received in one day at our home. By the time this is in print or is published, Thanksgiving will be at hand.

Having reached Medicare age, three of these headlines now have a real meaning. Mildred and I have been blessed with four children, all of whom have reached maturity and in most instances are well on the way to a life of their own. This is as it should be, and with three grandchildren we consider this our richest blessing.

About 25 years ago, after serious consideration of what we wanted most out of life, a rural setting was decided upon. For the past 24 years, our energies outside medicine have been expended in buying and managing farms, building up a large dairy, raising horses, tending an orchard, educating our children and, lastly, building a new home. All this did not happen by accident but required forethought, dedication and motivation, with help from everyone. This, again, has been a most successful family affair and we thank God for the comradeship and togetherness that united us to this common effort.

My great uncle, at the age of 98, after retiring at age 63 from the hotel business and at age 65 building up an entirely different, new business which he managed for more than 30 years, said to me: "John, whatever you do, never retire. Keep an interest in what's going on and never feel sorry for yourself because you are working too hard." Uncle Jake's struggle against the inevitable onslaught of old age was not found in pills or in doctors' offices, but very simply he never stopped doing the work he loved.

I do not favor compulsory retirement for myself at age 65, or at any age for that matter. If one is bored or bewildered by his work he should change, instead of



welcoming retirement. Thirty-five years ago, I came to Topeka for my first committee meeting. This week, I will make three more such trips to Topeka—more than 1,000 miles. Why? Because it makes me feel important, needed, necessary and, lastly, loved. If someone feels useless, his health, his interest in taking care of himself, and his urge to live longer will suffer. Decline in this area has nothing to do with either chronological age or genetic make-up. If anyone wants to know why I have been able to have so many and varied interests and to have worked so hard at each one for so many years, I can only say, I have enjoyed it.

Peace of mind is the greatest blessing and healer of all ills of mankind. The world will be a better place to live if we all would just count our blessings.

A handwritten signature in cursive script, appearing to read "John Blunk".

President



Editorial COMMENT

Praise the Lord and Pass the Politician

A few weeks ago, in their "Scorecard" department, the editors of *Sports Illustrated*, noting that India had refused to meet South Africa in the Davis Cup finals, pontificated that "Politics has no place in sports." Regardless of the social, economic, and ethnic factors which have produced South Africa's *apartheid* policy—and the fact that India gave us the original Untouchables and a disparity between levels of wealth and poverty unequalled by any country, you will note what was cited: politics.

There was a familiar ring to the phrase which caught our interest. Without doubt, at one time or another, someone has virtuously declared that politics has no place in (insert name of favorite enterprise). It is time, though (more appropriate in this political season perhaps), to put in a word for that much maligned activity. And with some justice in a medical communication, since physicians are among the most eager to declare their favorite pastime as the one most worthy to be free of this corrupting influence.

To keep the record straight—for a few words at least—it is recognized that the intent of the admonition in the case cited is to indicate that the purity of a particular endeavor must not be sullied by imposing political influence and expediency on its function. The implication is that politics can have only a degrading influence. The word has become almost synonymous with malfeasance or, as in this case, hypocrisy, and this is a sad thing since politics, like Pogo's "enemy," is us.

Human endeavor is divided into a considerable number of entities, some of them worthy, most of them maintained by high intrinsic principles, all contributing to the collective social state. But it should be recognized that politics is the matrix which holds them together, legitimizes their contributions, and correlates them in their social purpose. Without a political structure to support them, these separate endeavors would exist in, at best, a tangential relationship without effective intercommunication. Their principles would be intact and their chastity unthreatened but they would be sterile in effect. In short, politics does pervade every endeavor and

to say it has no place there is to endow it with an unjustified illegitimacy. This, in turn, results in a misunderstanding of political principles, which has contributed to its unhappy stereotype.

It always helps to have some embodiment of an abstract concept so the agents of political activity, the politicians, are blamed for anything one dislikes on the social scene and, from one angle or another, that's about everything. Politicians come in all sizes and shapes, even as physicians do. If bad ones do considerable harm, the good ones do considerable good—even as physicians do. Physicians enjoy calling attention to their high ratings on the admiration polls and the eagerness of the young to join the club. It seems a little puzzling, then, that while politicians are well down the list, there seems no dearth of recruits to their ranks. At any rate, physicians do not tolerate criticism well and perhaps this is why most of them shun politics. (Now lawyers, on the other hand, do well in the political arena, a fact which strengthens the average physician's conviction of their ulterior nature. As a matter of fact, it's mainly because they love to talk.)

It might help if, instead of reflexively castigating politics and denying its warp-and-woof relationship to our lives, we recognize it as an essential social ingredient with a continuing influence on the conduct of every phase of our lives. When, on occasion, it serves us some worthy purpose, we are pleased to note the soundness of the system and the wisdom and integrity of its agents. When it goes against our interests, the body politic suddenly becomes corporate evil and the politicians Mephistophelian scoundrels. We forget that social accomplishment is the net gain of the political ebb and flow. We overlook the fact that if politics functions in an undesirable manner, it is because we as individuals have functioned in an undesirable manner or failed to function when we should. It is pleasanter to attribute our successes to a wise and high-minded electorate and put our failures on the conniving politicians and the corrupt political system.

We suspect that the politician himself contributes to

this unhappy image. Does he, when confronted with the dotted line calling for business or profession, write in with pride, "Politician"? We doubt it. He may note the elective office he has achieved or some non-committal designation, but to boldly identify himself as a politician would be equivalent to proclaiming out-of-wedlock origin. He is certainly a victim of terminology. In every season, some orator announces that these are times that call for "statesmen." Of course, a statesman is really a politician who does what you want him to do. The walls of halls and homes are graced by the sternly noble visages of presidents, governors, legislators—statesmen, if you will—who got that way by being politicians—but successful politicians. Political respectability means taking off your work clothes and putting on the blue serge suit of success. This must be the hope and promise that keeps the young moving into the ranks of politics—this plus the inborn conviction of the young that they are dedicated to higher principles than their predecessors.

We like to think that if the athletes—or physicians—or businessmen—or bottle-washers of the world could get together, all would mingle in gladsome communication. The next step is to say that if only these great people of this great nation could get together with the great people of that great nation, brotherhood (and sisterhood presumably) would abound. Only the nasty politicians spoil the show. It is a little puzzling just why these parochial groups should be presumed to have the answer when they generally can't manage their own internal affairs without generating a fair amount of political heat. Rubbing elbows always produces a certain amount of friction which is then blamed on the politicians.

Well, society has made some progress over the years and we would do well to remember that political effort has made it possible. If politics has been able to accomplish something in spite of its low esteem, think what it might have done if we accorded it a little honor and respectability—at least, recognition of its positive purpose. So let's hear it for the politicians. After all, these are extraordinary times which call for all the honesty, integrity, and dedication we can muster from every quarter. One might even say these are times that call for *statesmen*.—D.E.G.

ACCP ESSAY CONTEST

Undergraduate medical students with a special interest in cardiovascular and pulmonary diseases are invited to enter the 1975 Alfred A. Richman Essay Contest sponsored by the American College of Chest Physicians. The annual contest was created to encourage undergraduate medical students to explore and investigate problems relating to the disciplines of the chest.

Three cash awards will be presented: first prize, \$1,000; second prize, \$500; third prize, \$250. Each winner will also receive a certificate of merit. The medical school attended by the first prize winner will be awarded a trophy inscribed with the winning student's name and the university to cite their accomplishment. The winning essay will be published in the College *Bulletin*.

All essays are coded and then judged by four physicians specializing in cardiovascular and pulmonary diseases. The judges will evaluate the essays on merit alone, with no knowledge of author or school.

Announcements of the winners will be made following the decision of the judges in May, and subsequently, awards will be presented at the Annual Meeting of the College to be held in Anaheim, California, October 26-30, 1975.

Suggested length of the essay is 2,000-2,500 words, and the deadline for submitting manuscripts is March 31, 1975. Application forms, including contest rules and regulations are now available from: Committee on College Essay, American College of Chest Physicians, 911 Busse Highway, Park Ridge, Illinois 60068.

Letters to VOX DOX should be addressed to the Vox Dox Editor, Journal of the Kansas Medical Society, 1300 Topeka Avenue, Topeka, Kansas 66612.

MOVING?

When you change your address, be sure to notify the JOURNAL, preferably one month in advance. In that way, you'll get every issue on time. Simply print your name, old address, and new address, on a postal card and send to: THE JOURNAL OF THE KANSAS MEDICAL SOCIETY, 1300 Topeka Avenue, Topeka, Kansas 66612.



Open Letter to the Doctors of Kansas

Dear Doctor:

cal costs. He challenged each doctor's wife to answer the following questions:

1. Does a patient in my husband's office feel that the people there care about him as an individual? Is the staff compassionate, friendly, concerned, helpful, and kind?

2. Is my husband able to spend enough time with each patient to justify his fee?

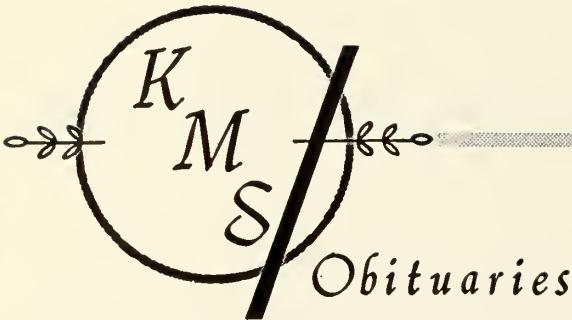
3. Am I doing a meaningful job for our medical partnership in our community via volunteer agencies, especially in areas affecting the community's "quality of life"?

Dr. Todd urged us to set the example of championing the individual's right to privacy by "keeping a tight lip" and NOT discussing our husband's patients or their conditions. He cited Mrs. Betty Ford as the most recent example of this invasion of a patient's right to privacy. His questions and observations point up the public's current criticisms of medicine. I hope this will make you take this home and say, "Here, Dear, read this! It's for you." I hope you do share the Kansas JOURNAL with your wife, so that she can stay informed on issues that necessarily affect you both. I would also urge that you share Dr. Todd's questions with your office staff for their information and consideration.

It was a real privilege for Anita and me to represent, reflect, and share the viewpoints and concerns of Kansas physicians' wives with the leadership of the National Auxiliary and that of other state auxiliaries. Now, how can we share and implement what we saw, heard, and learned? We hope to use it at our state conference and in state workshops to be held early in November. With your help, Doctor, we can gain your wife as an Auxiliary member and can share with her in the future. New members will increase needed input from the county level. We want a good sampling of ideas, opinions, concerns, and solutions. We WILL listen. Suggest that if she hasn't already joined that she do so and that you'll pay her dues (\$8.00 state and national; county dues vary). We can do more for you and have more fun Together.

Sincerely,

*Dot Meyer
President,
Woman's Auxiliary to the
Kansas Medical Society*



CYRIL C. BROWN, M.D.

Dr. Cyril C. Brown, 76, of Wichita, died July 22, 1974. He was born September 1, 1897, in Lenox, Iowa.

Dr. Brown was graduated from the University of Nebraska School of Medicine in 1926. An employee of the Sedgwick County Hospital, Dr. Brown retired from active practice in 1962.

Survivors include his wife and two daughters. A memorial fund was established with the MSSC Medical Careers Loan Fund.

MILLARD W. HALL, M.D.

Dr. Millard W. Hall, of Wichita, died October 3, 1974, at the age of 84. He was born June 25, 1890, in Iowa.

Dr. Hall was graduated from the Hahnemann Medical College, Chicago, in 1915. He was associated with the Booth Memorial Hospital for about 40 years.

Surviving Dr. Hall are his wife and a son.

RICHARD L. MERKEL, M.D.

Dr. Richard L. Merkel, 60, of Topeka, died August 15, 1974. He was born April 5, 1914, in Freeport, Illinois.

Dr. Merkel was graduated from the Loyola University School of Medicine, Chicago, in 1941. He was also graduated from the University of Cincinnati College of Pharmacy. Dr. Merkel has served as the personal physician to Governor Robert Docking.

Survivors include a daughter and two sons.

TOM W. STIVERS, M.D.

Dr. Tom W. Stivers, of Hutchinson, died August 9, 1974, at the age of 48. He was born August 11, 1926, in Cedar Rapids, Iowa.

Dr. Stivers was graduated from the University of Illinois School of Medicine in 1951.

HARRY J. VEATCH, M.D.

Dr. Harry J. Veatch, 77, of Pittsburg, died September 9, 1974. He was born July 18, 1897, in Weir City.

Dr. Veatch was graduated from the Rush Medical College, Chicago, in 1920. He practiced medicine in Pittsburg for over 45 years.

Surviving Dr. Veatch are his wife and two daughters.

Welcome to Portland, Oregon for the 28th Clinical Convention

November 30-December 4, 1974



"In this age of specialization, there's a vital need for discussion of the broader implications of new-found knowledge. The 28th AMA Clinical is designed for that purpose...to bring together physicians of the various specialties to study and discuss the broader aspects of medicine as they apply to their practices."

Huldrick Kammer, M.D., Chairman
Council on Scientific Assembly



For further details, write:
Circulation & Records Dept.
American Medical Association
535 North Dearborn Street
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When diarrhea wrings the wedding belle...

It's all very well to counsel patience in diarrhea patients. There are times when relief of symptoms can't come too soon.

X-ray studies¹ in 16 normal subjects showed just how promptly the active ingredient in Lomotil does its work.

Lomotil retarded gastrointestinal motility particularly during the first three hours after administration. It continued its moderating action on the bowel for at least three hours more.

Physicians prescribe Lomotil more often than any other drug when the urgency for the control of diarrhea is most distressing.

1. Demeulenaere, L.: Action du R 1132 sur le transit gastro-intestinal, *Acta Gastroent. Belg.* 21:674-680 (Sept.-Oct.) 1958.



Lomotil®

TABLETS/LIQUID

Each tablet and each 5 ml. of liquid contain:
diphenoxylate hydrochloride . . . 2.5 mg.
(Warning: May be habit-forming)
atropine sulfate 0.025 mg.

Saves the Day



IMPORTANT INFORMATION: This is a Schedule V substance by Federal law; diphenoxylate HCl is chemically related to meperidine. In case of overdosage or individual hypersensitivity, reactions similar to those after meperidine or morphine overdosage may occur; treatment is similar to that for meperidine or morphine intoxication (prolonged and careful monitoring). Respiratory depression may recur in spite of an initial response to Naline® (nalorphine HCl) or may be evidenced as late as 30 hours after ingestion. LOMOTIL IS NOT AN INNOCUOUS DRUG AND DOSAGE RECOMMENDATIONS SHOULD BE STRICTLY ADHERED TO, ESPECIALLY IN CHILDREN. THIS MEDICATION SHOULD BE KEPT OUT OF REACH OF CHILDREN.

Indications: Lomotil is effective as adjunctive therapy in the management of diarrhea.

Contraindications: In children less than 2 years, due to the decreased safety margin in younger age groups, and in patients who are jaundiced or hypersensitive to diphenoxylate HCl or atropine.

Warnings: Use with caution in young children, because of variable response, and with extreme caution in patients with cirrhosis and other advanced hepatic disease or abnormal liver function tests, because of possible hepatic coma. Diphenoxylate

HCl may potentiate the action of barbiturates, tranquilizers and alcohol. In theory, the concurrent use with monoamine oxidase inhibitors could precipitate hypertensive crisis.

Usage in pregnancy: Weigh the potential benefits against possible risks before using during pregnancy, lactation or in women of childbearing age. Diphenoxylate HCl and atropine are secreted in the breast milk of nursing mothers.

Precautions: Addiction (dependency) to diphenoxylate HCl is theoretically possible at high dosage. Do not exceed recommended dosages. Administer with caution to patients receiving addicting drugs or known to be addiction prone or having a history of drug abuse. The subtherapeutic amount of atropine is added to discourage deliberate overdosage; strictly observe contraindications, warnings and precautions for atropine; use with caution in children since signs of atropinism may occur even with the recommended dosage.

Adverse reactions: Atropine effects include dryness of skin and mucous membranes, flushing and urinary retention. Other side effects with Lomotil include nausea, sedation, vomiting, swelling of the gums, abdominal discomfort, respiratory depression, numbness of the extremities, headache, dizziness, depression, malaise, drowsiness, coma, lethargy, anorexia, restlessness, euphoria, pruritus, angioneurotic edema, giant urticaria and paralytic ileus.

Dosage and administration: Lomotil is contraindicated in children less than 2 years old. Use only Lomotil liquid for children 2 to 12 years old. For

ages 2 to 5 years, 4 ml. (2 mg.) t.i.d.; 5 to 8 years, 4 ml. (2 mg.) q.i.d.; 8 to 12 years, 4 ml. (2 mg.) 5 times daily; adults, two tablets (5 mg.) t.i.d. to two tablets (5 mg.) q.i.d. or two regular teaspoonsfuls (10 ml., 5 mg.) q.i.d. Maintenance dosage may be as low as one fourth of the initial dosage. Make downward dosage adjustment as soon as initial symptoms are controlled.

Overdosage: Keep the medication out of the reach of children since accidental overdosage may cause severe, even fatal, respiratory depression. Signs of overdosage include flushing, lethargy or coma, hypotonic reflexes, nystagmus, pinpoint pupils, tachycardia and respiratory depression which may occur 12 to 30 hours after overdose. Evacuate stomach by lavage, establish a patent airway and, when necessary, assist respiration mechanically. Use a narcotic antagonist in severe respiratory depression. Observation should extend over at least 48 hours.

Dosage forms: Tablets, 2.5 mg. of diphenoxylate HCl with 0.025 mg. of atropine sulfate. Liquid, 2.5 mg. of diphenoxylate HCl and 0.025 mg. of atropine sulfate per 5 ml. A plastic dropper calibrated in increments of $\frac{1}{2}$ ml. (total capacity, 2 ml.) accompanies each 2-oz. bottle of Lomotil liquid.

SEARLE

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San Juan, Puerto Rico 00936

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G. D. Searle & Co.
Medical Department, Box 5110,
Chicago, Illinois 60680

Sign of a cold sufferer

Time for Ornade®

Each Spansule® capsule contains 8 mg. Teldrin®
(brand of chlorpheniramine maleate);
50 mg. phenylpropanolamine hydrochloride;
2.5 mg. isopropamide, as the iodide.

Fast relief of upper respiratory congestion
and hypersecretion*
with convenient b.i.d. dosage.

Before prescribing, see complete prescribing information in SK&F literature or
PDR. The following is a brief summary.

* **Indications**

Based on a review of this drug by the National Academy of Sciences — National Research Council and/or other information, FDA has classified the indications as follows:

Possibly effective: For relief of upper respiratory tract congestion and hypersecretion associated with vasomotor rhinitis and allergic rhinitis, and for prolonged relief.

Lacking in substantial evidence of effectiveness: For relief of nasal congestion and hypersecretion associated with the common cold and sinusitis.

Final classification of the less-than-effective indications requires further investigation.

Contraindications: Hypersensitivity to any component; concurrent MAO inhibitor therapy; severe hypertension; bronchial asthma, coronary artery disease; stenosing peptic ulcer, pyloroduodenal or bladder neck obstruction. Children under 6.

Warnings: Caution patients about activities requiring alertness (e.g., operating vehicles or machinery). Warn patients of possible additive effects with alcohol and other CNS depressants.

Usage in Pregnancy: In pregnancy, nursing mothers and women who might bear children, weigh potential benefits against hazards. Inhibition of lactation may occur.

Effect on PBI Determination and I^{131} Uptake: Isopropamide iodide may alter PBI test results and will suppress I^{131} uptake. Substitute thyroid tests unaffected by exogenous iodides.

Precautions: Use cautiously in persons with cardiovascular disease, glaucoma, prostatic hypertrophy, hyperthyroidism.

Adverse Reactions: Drowsiness, excessive dryness of nose, throat or mouth; nervousness; or insomnia. Also, nausea, vomiting, epigastric distress, diarrhea, rash, dizziness, weakness, chest tightness, angina pain, abdominal pain, irritability, palpitation, headache, incoordination, tremor, dysuria, difficulty in urination, thrombocytopenia, leukopenia, convulsions, hypertension, hypotension, anorexia, constipation, visual disturbances, iodine toxicity (acne, parotitis).

Supplied: Bottles of 50 capsules; in Single Unit Packages of 100 (intended for institutional use only).

Smith Kline & French Laboratories

Division of SmithKline Corporation,
Philadelphia, Pa. 19101





A half-ounce of prevention

Use it to prevent a topical infection. Or to treat one that's already started.

In either case, it's good medicine. Whether for lacerations,
burns, open wounds, IV catheter or surgical aftercare.

Neosporin® Ointment provides broad antibacterial coverage against common
susceptible pathogens. And since it contains three antibiotics that are
rarely used systemically, the risk of sensitization is reduced.

Neosporin Ointment. A half-ounce of prevention. Also available in a
full ounce of prevention and in convenient foil packets.

Neosporin Ointment carried on Apollo and Skylab missions.

Neosporin® Ointment (polymyxin B-bacitracin-neomycin)

Each gram contains: Aerosporn® brand Polymyxin B Sulfate 5,000 units; zinc bacitracin 400 units;
neomycin sulfate 5 mg (equivalent to 3.5 mg neomycin base); special white petrolatum qs.
In tubes of 1 oz and 1/2 oz and 1/32 oz (approx.) foil packets.

INDICATIONS: Therapeutically, used as an adjunct to appropriate systemic therapy for topical infections, primary or secondary, due to susceptible organisms, as in: • infected burns, skin grafts, surgical incisions, otitis externa • primary pyoderma (impetigo, ecthyma, syphilis vulgaris, paronychia) • secondarily infected dermatoses (eczema, herpes, and seborrheic dermatitis) • traumatic lesions, inflamed or suppurating as a result of bacterial infection.

Prophylactically, the ointment may be used to prevent bacterial contamination in burns, skin grafts, incisions, and other clean lesions. For abrasions, minor cuts and wounds accidentally incurred, its use may prevent the development of infection and permit wound healing.

CONTRAINDICATIONS: Not for use in the eyes or external ear canal if the eardrum is perforated. This product is contraindicated in those individuals who have shown hypersensitivity to any of the components.

WARNING: Because of the potential hazard of nephrotoxicity and ototoxicity due to neomycin, care should be exercised when using this product in treating extensive burns, trophic ulceration and other extensive conditions where

absorption of neomycin is possible. In burns where more than 20 percent of the body surface is affected, especially if the patient has impaired renal function or is receiving other aminoglycoside antibiotics concurrently, not more than one application a day is recommended.

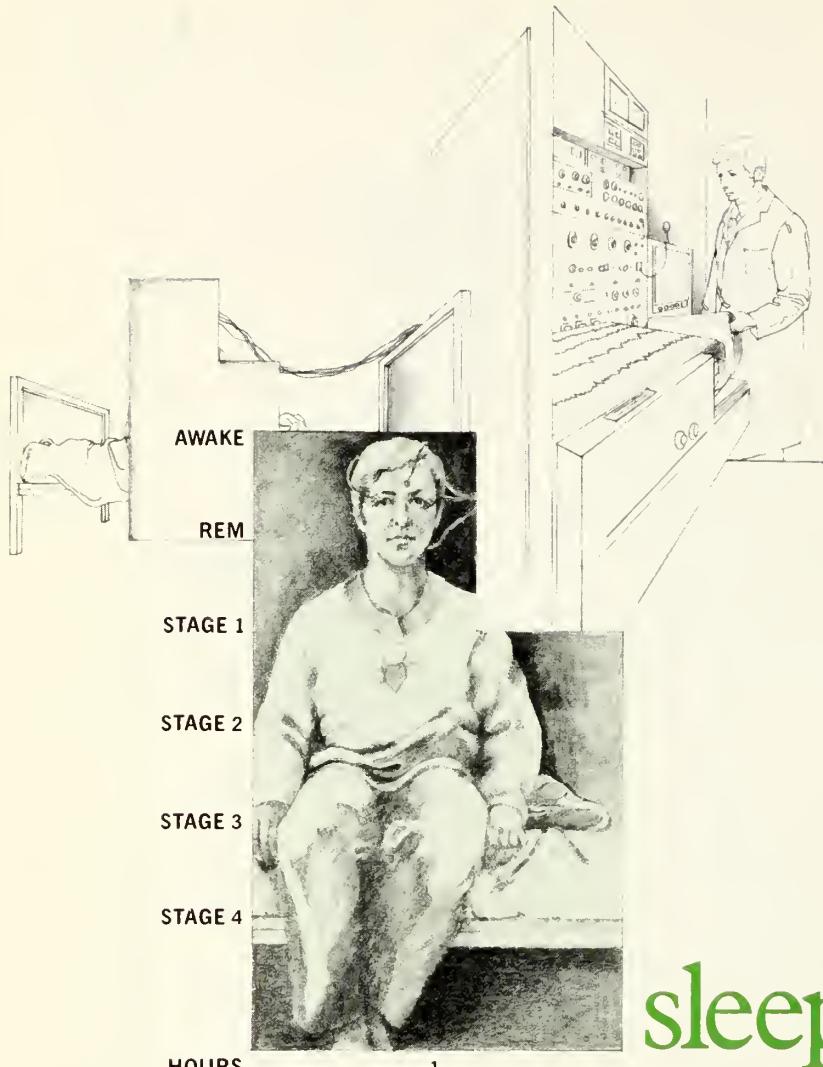
PRECAUTIONS: As with other antibacterial preparations, prolonged use may result in overgrowth of nonsusceptible organisms, including fungi. Appropriate measures should be taken if this occurs.

ADVERSE REACTIONS: Neomycin is a not uncommon cutaneous sensitizer. Articles in the current literature indicate an increase in the prevalence of persons allergic to neomycin. Ototoxicity and nephrotoxicity have been reported (see Warning section).

Complete literature available on request from Professional Services Dept. PML.



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**sleep
begins within
17 minutes, on average...
an initial benefit of**

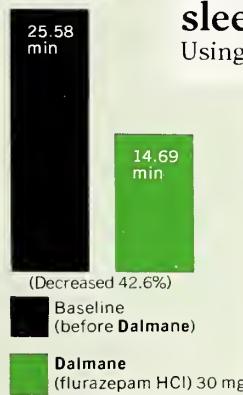
Dalmane®

(flurazepam HCl)

**proved by a
22-night clinical study of insomnia patients
in the sleep research laboratory and at home¹**

Three insomnia patients selected for difficulty falling asleep were administered Dalmane (flurazepam HCl) 30 mg for 14 consecutive nights. Placebo was given for four nights prior to and four nights after Dalmane. Physiologic tracings on Dalmane nights 1-3 showed sleep induction time averaged 13.90 minutes; on Dalmane nights 12-14, 18.80 minutes. Combined average for the 6 monitored drug nights was 16.35 minutes.¹

Average Time Required
to Fall Asleep (4 Studies,
16 Subjects²⁻⁵)



confirmed by clinical studies in four geographically separated sleep research laboratories²⁻⁵

Using a 14-night protocol involving eight insomniac and eight normal subjects, four studies confirmed the sleep-inducing effectiveness of Dalmane (flurazepam HCl) and the reproducibility of this response. On average, one 30-mg capsule induced sleep within 17 minutes. In all these studies, Dalmane induced sleep rapidly, reduced nighttime awakenings, and provided 7 to 8 hours of sleep without repeating dosage.²⁻⁵

Dalmane (flurazepam HCl) induces and maintains sleep, with relative safety

Dalmane is generally well tolerated; morning "hang-over" has been relatively infrequent. While dizziness, drowsiness, lightheadedness and the like have been noted most often, particularly in the elderly and debilitated, physicians should be aware of the possibility of more serious reactions, as noted below.

Before prescribing Dalmane (flurazepam HCl), please consult Complete Product Information, a summary of which follows:

Indications: Effective in all types of insomnia characterized by difficulty in falling asleep, frequent nocturnal awakenings and/or early morning awakening; in patients with recurring insomnia or poor sleeping habits; and in acute or chronic medical situations requiring restful sleep. Since insomnia is often transient and intermittent, prolonged administration is generally not necessary or recommended.

Contraindications: Known hypersensitivity to flurazepam HCl.

Warnings: Caution patients about possible combined effects with alcohol and other CNS depressants. Caution against hazardous occupations requiring complete mental alertness (e.g., operating machinery, driving). Use in women who are or may become pregnant only when potential benefits have been weighed against possible hazards. Not recommended for use in persons under 15 years of age. Though physical and psychological dependence have not been reported on recommended doses, use caution in administering to addiction-prone individuals or those who might increase dosage.

Precautions: In elderly and debilitated, initial dosage should be limited to 15 mg to preclude oversedation, dizziness and/or ataxia. If combined with other drugs having hypnotic or CNS-depressant effects, consider potential additive effects. Employ usual precautions in patients who are severely depressed, or with latent depression or suicidal tendencies. Periodic blood counts and liver and kidney function tests are advised during repeated therapy. Observe usual precautions in presence of impaired renal or hepatic function.

Adverse Reactions: Dizziness, drowsiness, lightheadedness, staggering, ataxia and falling have occurred, particularly in elderly or debilitated patients. Severe sedation, lethargy, disorientation and coma, probably indicative of drug intolerance or overdosage, have been reported. Also reported were headache, heartburn, upset stomach, nausea, vomiting, diarrhea, constipation, GI pain, nervousness, talkativeness, apprehension, irritability, weakness, palpitations, chest pains, body and joint pains and GU complaints. There have also been rare occurrences of sweating, flushes, difficulty in focusing, blurred vision, burning eyes, faintness, hypotension, shortness of breath, pruritus, skin rash, dry mouth, bitter taste, excessive salivation, anorexia, euphoria, depression, slurred speech, confusion, restlessness, hallucinations, and elevated SGOT, SGPT, total and direct bilirubins and alkaline phosphatase. Paradoxical reactions, e.g., excitement, stimulation and hyperactivity, have also been reported in rare instances.

Dosage: Individualize for maximum beneficial effect. *Adults:* 30 mg usual dosage; 15 mg may suffice in some patients. *Elderly or debilitated patients:* 15 mg initially until response is determined.

Supplied: Capsules containing 15 mg or 30 mg flurazepam HCl.



when restful sleep
is indicated

Dalmane® (flurazepam HCl)

One 30-mg capsule h.s. — usual adult dosage
(15 mg may suffice in some patients).

One 15-mg capsule h.s. — initial dosage for
elderly or debilitated patients.

- induces sleep within 17 minutes, on average
- reduces nighttime awakenings
- sustains sleep 7 to 8 hours, on average, without repeating dosage



ROCHE LABORATORIES
Division of Hoffmann-La Roche Inc.
Nutley, New Jersey 07110

REFERENCES: 1. Kales A, et al: Arch Gen Psychiatry 23:226-232, Sep 1970

2. Karacan I, Williams RL, Smith JR: The sleep laboratory in the investigation of sleep and sleep disturbances. Scientific exhibit at the 124th annual meeting of the American Psychiatric Association, Washington DC, May 3-7, 1971

3. Frost JD Jr: Data on file, Medical Department, Hoffmann-La Roche Inc, Nutley NJ

4. Vogel GW: Data on file, Medical Department, Hoffmann-La Roche Inc, Nutley NJ

5. Dement WC: Data on file, Medical Department, Hoffmann-La Roche Inc, Nutley NJ

The Role of the Detail Man

Dr. Willard Gobbell
Family Physician
Encino, California



Dr. Jeremiah Stamler
Chairman
Department of Community
Health and Preventive
Medicine, and Dingman
Professor of Cardiology
Northwestern University
Medical School



"I may be prejudiced, but I am very much in favor of the detail men I meet. Most of them are knowledgeable about the drugs they promote and can be a great help in acquainting me with new medication."

Family Physician's Perception

I think that most general practitioners in this area feel as I do about the detail man. Over the years I have gotten to know most of the men who visit me regularly and they in turn have become aware of my particular interests and the nature of my practice. They, therefore, limit their discussion as much as possible to the areas of interest to me. Since I usually see the same representative again in future visits, it is in his best interest to supply me with the most honest, factual, as well as up-to-date information about his products.

"In the total picture of dealing with health problems in this country there is a potential for detail men to play a meaningful role."

The Positive Influence

My contact with representatives and salesmen of the pharmaceutical industry is the type of contact that people in a medical center, research people, and academic people have and that's in all likelihood on a somewhat different level from that of the practicing physician.

Let me touch on how I personally perceive the role of the sales representative. These men reach large numbers of health professionals. Thus they could be—and at times actually are—disseminators of useful information. They could consistently serve a real educational function in their ability to discuss their products.

At present they do distribute printed material, brochures and pamphlets—some of it scientifically sound and therefore truly useful—as well as some excellent films produced by the pharmaceutical industry. When they function in this

Opinion & Dialogue

Is He a Source of Information?

Yes, with certain reservations. The average sales representative has a great fund of information about the drug products he is responsible for. He is usually able to answer most questions fully and intelligently. He can also supply reprints of articles that contain a great deal of information. Here, too, I exercise some caution. I usually accept most of the statements and opinions that I find in the papers and studies which come from the larger teaching facilities. It goes without saying that a physician should also rely on other sources for his information on pharmacology.

Training of Sales Representatives

Ideally, a candidate for the position as a sales representative of a pharmaceutical company should be a graduate pharmacist who has a questioning mind. I don't think this is possible in every case, and so it becomes the responsibility

of the pharmaceutical company to train these individuals comprehensively. It is of very great importance that the detail man's knowledge of the product he represents be constantly reviewed as well as updated. This phase of the sales representative's education should be a major responsibility of the medical department of the pharmaceutical company.

I am certain that most of these companies take special care to give their detail men a great deal of information about the products they produce—information about indications, contraindications, side effects and precautions. Yet, although most of the detail men are well informed, some, unfortunately, are not. It might be helpful if sales representatives were reassessed every few years to determine whether or not they are able to fulfill their important function. Incidentally, I feel the same way about periodic assessments of everyone

in the health care field, whether they be general practitioners, surgeons or salesmen.

Value of Sampling

I personally am in favor of limited sampling. I do not use sampling in order to perform clinical testing of a drug. I feel that drug testing should rightly be left to the pharmacology researcher and to the large teaching institutions where such testing can be done in a controlled environment.

I do not use samples as a "starter dose" for my patients. I do, however, find samples of drugs to be of value in that they permit me to see what the particular medication looks like. I get to see the various forms of the particular medication at first hand, and if it is in a liquid form I take the time to taste it. In that way I am able to give my patients more complete information about the particular medications that I prescribe for them.

capacity they are indeed useful; particularly in the fact that they disseminate broadly based educational material and serve not just as "pushers" of their drugs.

The Other Side of the Coin

Obviously, the pharmaceutical companies are not producing all this material as a labor of love—they are in the business of selling products for profit. In this regard the ambitious and improperly motivated sales representative can exert a negative influence on the practicing physician, both by presenting a one-sided picture of his product, and by encouraging the practitioner to depend too heavily on drugs for his total therapy. In these ways, the salesman has often distorted objective reality and undermined his potential role as an educator.

The Industry Responsibility

Since the detail man must be an information resource as well as a representative of his particular pharmaceutical company, he should be carefully selected and

thoroughly trained. That training, however, must be an ongoing one. There must be a continuing battle within and with the pharmaceutical industry for high quality not only in the selection and training of its sales representatives, but also in the development of all of its promotional and educational material.

The industry must be ready to accept constructive as well as corrective criticism from experts in the field and consumer spokesmen, and be willing to accept independent peer review. The better educated and prepared the salesman is, the more medically accurate his materials, the better off the pharmaceutical industry, health professionals and the public—i.e., the patients—will be.

Physician Responsibility

The practicing physician is in constant need of up-dated information on therapeutics, including drugs. He should and does make use of drug information and answers to specific questions supplied by the pharmaceutical representative. However, that informa-

tion must not be his main source of continuing education. The practitioner must keep up with what is current by making use of scientific journals, refresher courses, and information received at scientific meetings.

The practicing physician not only has the right, but has the responsibility to demand that the pharmaceutical company and its representatives supply a high level of valid and useful information. I feel certain that if such a high level is demanded by the physician as well as the public, this demand will be met by an alert and concerned pharmaceutical industry.

From my experience, my impression is that sectors of the pharmaceutical industry are indeed ethical. I challenge the industry as a whole to live up to that word in its finest sense.





Book REVIEWS

POST-MORTEM, by David M. Spain, M.D. Doubleday & Co., Inc., New York. 1974. 296 pages. \$7.95.

This 286-page "Postmortem" is interesting and thought-provoking reading for a doctor and his entire family. It is written in nontechnical language, describing Dr. Spain's experience in forensic pathology over a 30-year period, while being based as a medical examiner for Westchester County, New York. He describes his increasing depth of involvement through forensic pathology in the area of civil rights, including the murders of the civil rights workers in Mississippi, the Fred Hampton shoot-out, the Alice Crimmins trial, the New Haven Panthers, and many other investigations in which his testimony, based on modern technology of refined ballistics, x-rays, dental identification, and microscopic study exposed the truth. He also describes his extreme frustration with man's inhumanity to man, and with the American system of justice, where the culprits are not only the elected officials at times, but are influenced by large vested interests.

The Moore case points out that even at its highly developed state, forensic pathology is not perfect, as recorded in differing opinions between the author and Dr. Milton Helpern in more than one instance.

In the closing pages of this most interesting book, Dr. Spain reflects on the great waste of our lives, starting with our disposable (expendable) needles, syringes, trays, cups, knives, forks to the extremes of disposable humans, as exemplified in the Attica prison affair, yet he surprisingly supports abortion even though it means destruction of normal human tissue.

The main message to the family physician is to take time to fully reflect on the cause of his patient's death, and not to hesitate to declare it a coroner's case, if that exists to even a slight degree.—E.M.M.

NEONATOLOGY: DISEASES OF THE FETUS AND INFANT, by Richard E. Behrman, M.D. The C. V. Mosby Co., St. Louis. 1973. 698 pages, 215 illustrations. \$39.50.

The book is a broad survey of the evaluation, detection, and treatment of most of the problems confronting the physician responsible for the newborn. The material is well organized and written for the pediatric generalist.

Early chapters include those dealing with evaluation of the high-risk infant, and an extremely helpful chapter by Dr. Stanley James on emergencies in the delivery room. Routine care and fluid therapy are well covered, including an important chapter by Drs. Klaus and Kennell, describing their work studying mother-infant relationships.

Subsequent chapters are specifically oriented to diseases and organ systems in the familiar medical text style. These are broad and complete. If any criticism could be rendered, it might be the emphasis in detail and space devoted to some chapters, such as diseases of the cardiovascular system. Such material is beyond the needs of the general pediatrician, who would seek the help of the cardiologist long before reaching such depths of diagnosis and treatment.

A table of normal values and drug doses for newborns in the appendix is a welcome addition. The book is well organized and each chapter has a good bibliography. This type of reference should be readily available, particularly to the generalist caring for newborns in a community hospital.—A.C.C.

THE MALNOURISHED MIND, by Elie Shneour. Doubleday & Co., Inc., New York. 1974. 216 pages. \$6.95.

This book deals with diet and its impact on brain development and intelligence. The first part of the book deals with experiments showing how a low protein diet given to pregnant rats can impair the ability of the offspring to run the complicated mazes. The book discusses the relationship of low protein diet in the human fetus and babyhood and the low IQ of the child.

The book then deals with hunger and its side effect on the human intellectual, social, and political life followed by a general discussion of the IQ test, and makes the point: "Some elements of what we call intelligence is assessed in the IQ test."

In the chapter, "From Breast to Gruel," the author states, "This control requirement poses a particularly difficult, if not presently insolvable, problem in relating malnutrition to brain development and subsequent mental performance."

(Continued on page 14)

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The more physicians consider the hemodynamics of lowering blood pressure...

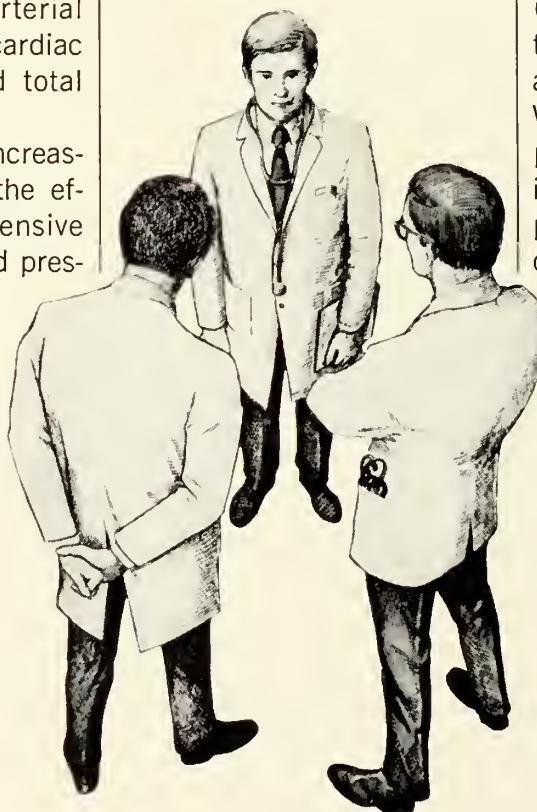
Most physicians now agree on the importance of reducing blood pressure in the hypertensive patient. But high blood pressure exists, of course, only as part of a complete clinical picture. The hemodynamic profile of well-established essential hypertension is characterized by elevated arterial blood pressure, normal cardiac output, and increased total peripheral resistance. And so, physicians are increasingly concerned with the effects of an antihypertensive agent not only on blood pres-

sure itself but also on the hemodynamic pattern—in short, with the total effect of the drug. Does it indeed help lower blood pressure effectively? Is peripheral resistance reduced? Are cardiac output and renal functions main-

tained? And, also, is there likely to be drug-induced postural hypotension serious enough to pose a threat to the patient's cerebrovascular status?

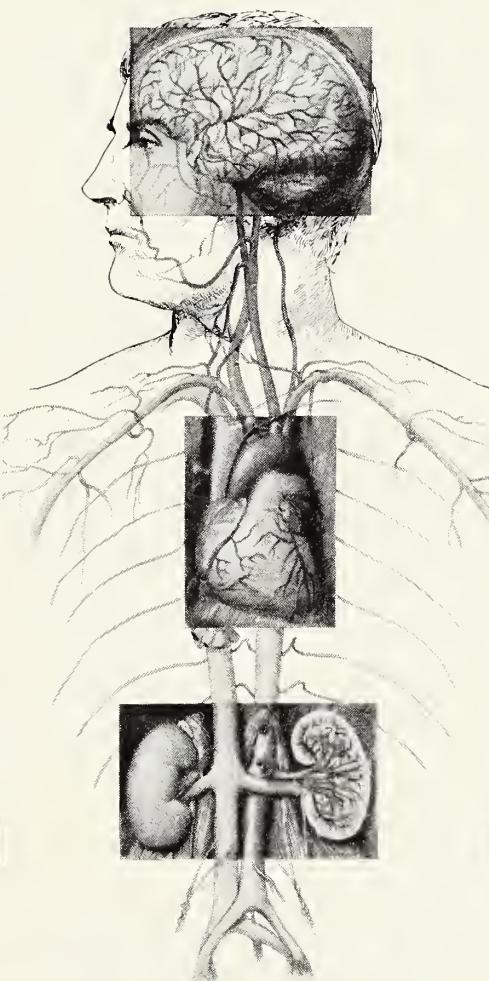
With this emphasis on overall drug performance has come a growing reliance on ALDOMET® (Methyldopa, MSD) in the treatment of sustained moderate hypertension.

With its unique hemodynamic profile, ALDOMET has drawn increasing attention and approval from physicians. First, of course, for its efficacy in



the more physicians rely on this unique antihypertensive

lowering blood pressure. But there are other considerations as well. Cardiac output is usually maintained with no cardiac acceleration; in some patients the heart rate is actually slowed. Peripheral resistance is apparently reduced. ALDOMET does not usually compromise existing renal function; it generally does not reduce renal blood flow, glomerular filtration rate, or filtration fraction. And ALDOMET usually does not cause symptomatic postural or exercise hypotension.



Contraindications include active hepatic disease and known sensitivity to the drug. Use with caution in patients with a history of liver disease or dysfunction. Not recommended in pheochromocytoma or pregnancy. It is important to recognize that a positive Coombs test, hemolytic anemia, and liver disorders may occur with methyldopa therapy. The rare occurrences of hemolytic anemia or liver disorders could lead to potentially fatal complications unless properly recognized and managed. For more details see the brief summary of prescribing information.

In most cases of sustained moderate hypertension

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now available in
500 mg TABLETS
as well as the standard
250-mg tablets

For a brief summary of prescribing information,
please see following page.

**In most cases of
sustained moderate hypertension**

ALDOMET[®] **(METHYLDOPA MSD)**

smoothly lowers blood pressure

Contraindications: Active hepatic disease, such as acute hepatitis and active cirrhosis. Known sensitivity. Not recommended in pheochromocytoma. Unsuitable in mild or labile hypertension responsive to mild sedation or thiazide therapy. Use cautiously in patients with history of previous liver disease or dysfunction.

Warnings: It is important to recognize that a positive Coombs test, hemolytic anemia, and liver disorders may occur with methyldopa therapy. The rare occurrences of hemolytic anemia or liver disorders could lead to potentially fatal complications unless properly recognized and managed. Read this section carefully to understand these reactions.

With prolonged methyldopa therapy, 10% to 20% of patients develop a positive direct Coombs test, usually between six and twelve months of therapy. Lowest incidence is at daily dosage of 1 g or less. This on rare occasions may be associated with hemolytic anemia, which could lead to potentially fatal complications. One cannot predict which patients with a positive direct Coombs test may develop hemolytic anemia. Prior existence or development of a positive direct Coombs test is not in itself a contraindication to use of methyldopa. If a positive Coombs test develops during methyldopa therapy, determine whether hemolytic anemia exists and whether the positive Coombs test may be a problem. For example, in addition to a positive direct Coombs test there is less often a positive indirect Coombs test which may interfere with cross matching of blood.

At the start of methyldopa therapy, it is desirable to do a blood count (hematocrit, hemoglobin, or red cell count) for a baseline or to establish whether there is anemia. Periodic blood counts should be done during therapy to detect hemolytic anemia. It may be useful to do a direct Coombs test before therapy and at six and twelve months after the start of therapy. If Coombs-positive hemolytic anemia occurs, the cause may be methyldopa and the drug should be discontinued. Usually the anemia remits promptly. If not, corticosteroids may be given and other causes of anemia should be considered. If the hemolytic anemia is related to methyldopa, the drug should not be reinstated. When methyldopa causes Coombs positivity alone or with hemolytic anemia, the red cell is usually coated with gamma globulin of the IgG (gamma G) class only. The positive Coombs test may not revert to normal until weeks to months after methyldopa is stopped.

Should the need for transfusion arise in a patient receiving methyldopa, both a direct and an indirect Coombs test should be performed on his blood. In the absence of hemolytic anemia, usually only the direct Coombs test will be positive. A positive direct Coombs test alone will not interfere with typing or cross matching. If the indirect Coombs test is also positive, problems may arise in the major cross match and the assistance of a hematologist or transfusion expert will be needed.

Fever has occurred within first three weeks of therapy, sometimes with eosinophilia or abnormalities in liver function tests, such as serum alkaline phosphatase, serum transaminases (SGOT, SGPT), bilirubin, cephalin cholesterol flocculation, prothrombin time, and bromsulphalein retention. Jaundice, with or without fever, may occur, with onset usually in the first two to three months of therapy. Rarely fatal hepatic necrosis has been reported. These hepatic changes may represent hypersensitivity reactions; periodic determination of hepatic function should be done particularly during the first six to twelve weeks of therapy or

whenever an unexplained fever occurs. If fever, abnormalities in liver function tests, or jaundice appear, stop therapy with methyldopa. If caused by methyldopa, the temperature and abnormalities in liver function characteristically have reverted to normal when the drug was discontinued. Methyldopa should not be reinstated in such patients. Rarely, reversible reduction in leukocyte count with primary effect on granulocytes has been seen. Reversible thrombocytopenia has occurred rarely. When used with other antihypertensive drugs, potentiation of antihypertensive effect may occur.

Use in Pregnancy and Childbearing Age—Not recommended in pregnancy. In women of childbearing age, weigh potential benefits against possible fetal hazards.

Precautions: Methyldopa may interfere with measurement of: uric acid by the phosphotungstate method, creatinine by the alkaline picrate method, and SGOT by colorimetric methods. Since methyldopa causes fluorescence in urine samples at the same wavelengths as catecholamines, spuriously high levels of urinary catecholamines may be reported. This will interfere with the diagnosis of pheochromocytoma. Stop drug if involuntary choreoathetotic movements occur in patients with severe bilateral cerebrovascular disease. Patients may require reduced doses of anesthetics; hypotension occurring during anesthesia usually can be controlled with vasoconstrictors. Hypertension has occurred after dialysis in patients on methyldopa because the drug is removed by this procedure.

Adverse Reactions: Sedation, usually transient, may be seen during initial therapy or when dosage is increased. Headache, asthenia, or weakness may be noted as early, transient symptoms. Symptoms associated with effective lowering of blood pressure are occasionally seen and include dizziness, lightheadedness, and symptoms of cerebrovascular insufficiency. Angina pectoris may be aggravated. Symptoms of orthostatic hypotension may occur; if symptoms occur, reduction of dosage is suggested. Bradycardia, nasal stuffiness, mild dryness of mouth, and gastrointestinal symptoms including distention, constipation, flatulence, and diarrhea occur occasionally; these generally can be relieved by reducing dosage. Nausea and vomiting have been reported in only a few patients. Sore tongue or "black tongue," pancreatitis, and inflammation of salivary glands may occur.

Weight gain and edema occur infrequently and are relieved by administering a thiazide diuretic; if edema progresses or signs of pulmonary congestion appear, discontinue drug. A rise in BUN has been observed. Other rare reactions include breast enlargement, lactation, impotence, decreased libido, skin rash, mild arthralgia, myalgia, paresthesias, Bell's palsy, parkinsonism, psychic disturbances including nightmares, reversible mild psychoses or depression. Urine exposed to air after voiding may darken because of breakdown of methyldopa or its metabolites.

Note: Dosage should be limited initially to 500 mg daily when following previous antihypertensive agents other than thiazides. Maximal recommended daily dose is 3.0 g. Patients with impaired renal function may respond to smaller doses than patients with normal kidney function. Syncope in older patients has been related to increased sensitivity in those with advanced arteriosclerotic vascular disease; this may be avoided by lower doses. Tolerance occasionally seen either early or late, but more likely between second and third month after initiation of therapy; increased dosage or combined therapy with a thiazide frequently restores effective control.

How Supplied: Tablets, containing 250 mg methyldopa each, in single-unit packages of 100 and bottles of 100 and 1000; Tablets, containing 500 mg methyldopa each, in single-unit packages of 100 and bottles of 100.

For more detailed information, consult your MSD representative or see full prescribing information. Merck Sharp & Dohme, Division of Merck & Co., Inc., West Point, Pa. 19486

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Information for Authors

Manuscript Preparation

Manuscripts must be typewritten, double spaced, leaving wide margins. Submit the original, plus one copy if possible.

Titles should be short, specific, and amenable to indexing. A subtitle is frequently used to keep the main title short.

Summary: All manuscripts should include a short abstract which is a factual (not descriptive) summary of the work.

Author Responsibility: The author is responsible for all statements made in his work, including changes made by the copy editor. Manuscripts are received with the explicit understanding that they are not simultaneously under consideration by any other publication. Publication elsewhere will be subsequently authorized at the discretion of the Editor.

Galley Proof: To make extensive changes in the article after the text has been set in type may require an additional cost which exceeds the original. The galley proof is for correction of ERRORS, and a rewriting of the article should be done on the original copy BEFORE it is submitted for publication.

Drugs should be called by their generic names; the trade names can be added in parentheses if they are considered important. All units of measure must be given in the metric system.

References

Bibliographic references should not exceed 20 in number, documenting key publications. Personal communications and unpublished data should not be included. References should be arranged according to the order of citation, and not alphabetically. All references must be numbered consecutively and all must be cited in the text. Use the style of the AMA publications, giving; name of author, title of article, name of periodical, volume, pages, year.

Illustrations

All material which cannot be set in type, such as photographs, line drawings, graphs, charts, tracings (for preparation of tables, see below) must be mounted on white cardboard. All must be identified on the back as to figure number, author's name, and an arrow indicating top. Legends should be typed double spaced on a separate sheet of paper, limited to a maximum of 30 words.

Drawings and graphs should be done professionally in India ink on illustration board or high grade white drawing paper.

Photographic material should be submitted in duplicate as high-contrast, glossy prints. Color illustrations will be accepted for publication only if the author assumes the cost.

THE JOURNAL will assume the cost of B/W engravings and cuts up to \$35 (or 5 cuts). Engraving cost for illustrations in excess of \$35 will be billed to the author.

Tables

Because tables are set by hand, their cost is comparable to illustrations. A reasonable number of tables are allowed without cost to the author.

Tables should be self-explanatory and should supplement, not duplicate, the text. Since the purpose of a table is to compare or classify related items, the data must be logically and clearly organized. The relationship and comparison are established by the correct choice of column heads (captions of vertical columns) and stubs (left entries in horizontal listings).

Each table should be typed double spaced, including all headings, on separate sheets of lettersize paper. Oversize paper should not be used. Instead, repeat heads and stubs on a second sheet for tables requiring extra width. Number tables consecutively. Each table must have a title.

Reprints

A reprint order form with a table covering cost will be sent with the galley proof to each contributor. Since the JOURNAL has no way to provide for reprints, they must be ordered by the author and purchased directly from the printer.

PHYSICIAN, CHIEF OF MATERNAL AND CHILD HEALTH SERVICES: To assume responsibility for the maintenance and supervision of the Maternal and Child Health Program for a city-county health department now serving a population of approximately 400,000. Physician, licensed or eligible to practice medicine in Nebraska, Master of Public Health, or Board eligible in areas of Preventive Medicine or Pediatrics or equivalent graduate or resident training. Salary range \$29,100 to \$37,090, plus retirement and other fringe benefits. Contact

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3939 Leavenworth
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Telephone 402-444-7471.

CLINIC PHYSICIAN: With special interest in the area of Maternal and Child Health for a city-county health department now serving a population of approximately 400,000. Physician licensed or eligible to practice medicine in Nebraska. Contact

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Book Reviews

(Continued from page 8)

The author's attempts at assessments of the evidence that bears on early life malnutrition of the human has something to offer to the psychologist, social scientist, and political scientist; for the physician, it is an easy review of the general subject of malnutrition and society, as well as how it affects the human mind.—D.E.E.

THE UNCERTAIN MIRACLE: HYPERBARIC OXYGENATION, by Vance H. Trimble. Doubleday & Co., Inc., New York. 1974. 236 pages illustrated. \$6.95.

"The Uncertain Miracle" is a very interesting and readable book. It is surprising, however, to learn that the author is the editor of the *Kentucky Post and Times Star*, in Covington, Kentucky, and not a research scientist in the field. Since the author is a reporter, the writing is lively and the subject is presented in entertaining style.

In the early chapters, Mr. Trimbal makes historical reference to the work of Dr. Orval J. Cunningham, who was professor of anesthesiology at the Kansas University Medical Center at the close of World War I. The author then proceeds to informatively narrate the history of the use of air and oxygen under pressure. Perhaps some of the writing is noteworthy for its news angle, e.g., a whole chapter is devoted to the unfortunate death of the son of John F. Kennedy, despite treatment with hyperbaric oxygenation in the pressure tank at Harvard Medical School. The use of hyperbaric oxygen is chronicled in the treatment of gas gangrene, stroke, old age, acute myocardial infarction, burns, carbon monoxide poisoning, and it is even hinted that it is good for sexual inadequacy. In spite of the interest the book engenders with its detailing of the miraculous responses to this form of therapy, the reason that it has not been considered a universal panacea is found in the last three chapters, which are devoted to the discussion of the problem of oxygen toxicity. There the author presents the arguments as formulated by outstanding authorities in the field, against the use of this modality of therapy. Perhaps the problem can be summed up by stating that until more is known about the pharmacology of oxygen and the physiologic responses of the human being to increased pressures of oxygen, the use of hyperbaric oxygenation should be restricted to research activities where these aspects of its use can be scientifically determined.

While the book is extremely interesting and contains a wealth of information about the subject of hyperbaric oxygenation, there are objections to considering it scientific literature in the usual sense. The first, of course, is that it is not an authentic text written by an authority

in the field; secondly, it lacks a bibliography; and third, its statements are not supported by scientific data. When the cautious approach of its strongest proponents and the apparent loss of enthusiasm of some of its earliest users are added to the fact that the initial outlay for a tank is quite expensive, it is readily understood why the medical profession has not accepted it as a primary mode of therapy. Despite this criticism, however, it does present an overview of the subject and is informatively written in a relaxing style. Although it cannot be recommended as a text on the subject, it is heartily endorsed as interesting reading for a plane trip, a cruise, other vacation endeavor, or general information.

A directory of hyperbaric chambers in the United States, Canada, Mexico, and Puerto Rico is appended.—J.A.O'G.

AAMA CERTIFICATION EXAM

A total of 540 CMA certificates—the highest number in the 18-year history of the American Association of Medical Assistants—were earned in 1974 by those taking the annual certification examination. Included among the newly certified from Kansas were: Sheri D. Cox, Betty N. Koch, Thelma A. Mayhill, Bobby A. Runyan, and Corinne B. Squire, of Wichita; Rosella J. Flax, of Ransom; Frances V. Lamkin, of Wellington; and Mary E. Slagle, of Ness City.

This record also includes 23 who passed the new pediatric examination offered for the first time this year. This program is conducted by AAMA in collaboration with the American Academy of Pediatrics. Beginning in 1975, the examination will have a new format, consisting of the basic certification examination and three specialty examinations: administrative, clinical, and pediatrics.

The AAMA, a national organization of 15,500 medical assistants employed by physicians, offers the certification examination at more than 70 centers throughout the country. Information may be obtained from the AAMA, 1 East Wacker Drive, Chicago, Illinois 60601.





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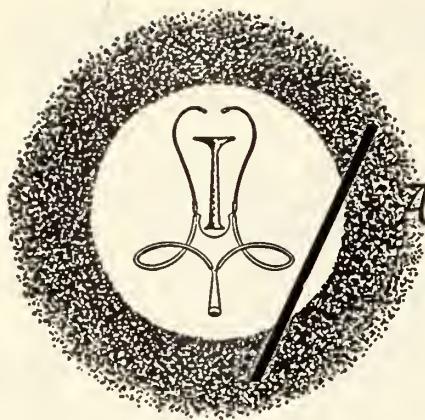
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Announcements

Professional meetings, conferences, and postgraduate courses of national importance are listed for the DOCTOR'S CALENDAR. Notice of the session is posted in advance to allow the physician time to make preparations.

NOVEMBER

- Nov. 11-13 42nd Annual, Omaha Mid-West Clinical Society, Omaha Hilton. Write: Mary E. Pilloud, 1040 Medical Arts Bldg., Omaha 68102.
- Nov. 18-22 American Heart Association, Fairmont Hotel, Dallas. Write: W. W. Moore, 44 East 23rd St., New York 10010.
- Nov. 19 *Gastrointestinal CPC With Medical and Surgical Overtones*, The Moila Temple, St. Joseph, Mo. KUMC and Missouri Academy of Family Physicians sponsored. Write: KUMC Postgraduate Medical Education, Kansas City, Kansas 66103.
- Nov. 21-23 Diseases of the Liver (Miami U. postgraduate course), Fontainebleau, Miami. Write: Leon Schiff, M.D., PO Box 520875, Biscayne Annex, Miami 33152.
- Nov. 21-24 Annual Meeting, American Association for Clinical Immunology and Allergy, Ft. Lauderdale, Florida. Write: John L. Dewey, M.D., PO Box 912, DTS, Omaha 68101.
- Nov. 25-27 Treatment and Rehabilitation (American Cancer Society Conference), Waldorf-Astoria Hotel, New York City.

Nov. 30-Dec. 4 American Medical Association, Portland.

JANUARY

- Jan. 2-7 Pediatric Nephrology Seminar, Americana Hotel, Bal Harbor, Florida. Write: Dept. of Pediatrics, University of Miami School of Medicine, PO Box 520875 Biscayne Annex, Miami 33152.

FEBRUARY

- Feb. 12 6th Annual Arthur E. Hertzler Memorial Lectures, The Hertzler Research Foundation, Halstead, Kansas.

Feb. 21-22 Pediatric Behavior Management, Miami. Write: Dept. of Pediatrics, University of Miami School of Medicine, PO Box 520875 Biscayne Annex, Miami 33152.

University of Kansas Postgraduate Education:

- Nov. 12-15 *Internal Medicine*
Nov. 21-22 *Medical Technology*
Dec. 9-10 *Battered Child*
Jan. 23-24 *Gyn-Ob*
Feb. 12-14 *Diagnostic Cytology*
Feb. 26 *The Mentally Handicapped Child*

For further details, see pages 325 and 330.

NEW MEMBERS

The JOURNAL takes this opportunity to welcome these new members into the Kansas Medical Society.

- | | |
|--|--|
| Patrick N. Barker, M.D.
138 East 16th St.
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Kansas State University
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| Donald C. White, M.D.
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Month in Washington

President Ford's long-heralded summit economic conference produced relatively little talk about health care costs and inflation, despite the fact that HEW Secretary Weinberger has of late frequently sounded such an alarm.

Nor was there any indication during the Washington parley that the Administration was considering controls at this time, although Senate Majority Leader Mike Mansfield (D-Mont.) urged the 800 delegates to request such controls.

However, it became clear to conference observers that the President will ask Congress to approve certain but unspecified tax changes and to cut the federal budget to combat inflation.

AMA President Malcolm C. Todd, a delegate to the summit conference, said that he agreed with the President with respect to avoiding controls at this time—"particularly discriminatory cost controls." "Every American, every physician, has the duty to assist in solving the number one problem of the nation— inflation," Dr. Todd said, noting that the AMA has repeatedly stressed the need for restraints by physicians in avoiding unjustifiable charges and fee increases.

A summary of the earlier pre-summit session on health was presented by Michael Zubkoff, Professor of

Health Economics at Meharry Medical College and Vanderbilt University. He stated that "it is generally recognized that the health sector is both a hostage and a cause of inflation."

According to Professor Zubkoff, the pre-summit meeting had determined certain "structural defects" in the health care delivery system which included:

"Fee-for-service payment for physicians and cost-plus reimbursement for hospitals . . . encourages cost growth.

"First dollar insurance coverage reduces cost-consciousness by consumers.

"Consumers lack knowledge to become aggressive, informed purchasers of health care."

Among the "common themes" stressed at the pre-summit health conference, Zubkoff said, were that the federal commitment to health care should not be reduced; that structural reform is needed; and that existing incentives and regulatory mechanisms are inadequate. "There was a definite lack of a widespread consensus on solutions to cost problems in health during the pre-summit meeting," Zubkoff told the summit meeting.

While pleased that President Ford had not called for

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wage-price clamps by the federal government, Dr. Todd at the same time criticized the Administration for "singling out" health by "annualizing" monthly consumer price index levels. The practice of projecting the yearly increase on the basis of what happens during one month or several months has been followed only on "health," so as to bolster the contention that the health segment should be isolated for controls, Dr. Todd charged.

Suggested steps to curb medical costs, listed by Dr. Todd, were preadmission testing; expansion of ambulatory care services; earlier discharge from hospitals; avoidance of unnecessary hospitalization; reducing wasteful testing, prescribing and treatment; and decreasing the cost of malpractice insurance.

In addition, Dr. Todd said, there must be incentives to produce more family physicians and to plan for needed specialists only.

"Perhaps physicians should attempt voluntarily to guide their fee-setting decisions by tying their charges to the consumer price index levels and not exceeding them," Dr. Todd suggested.

A wide range of health care related subjects were discussed at a recent meeting between an AMA delegation and HEW Secretary Caspar Weinberger.

Malcolm Todd, M.D., President of the AMA, said the Secretary and his aides were told that the AMA

desires the best possible national health insurance (NHI) program that can be worked out, but cautioned against any hurry-up approval in an emotionally-charged Congress late in the session.

Dr. Todd said he emphasized that the number one problem facing the nation at present is inflation and that, therefore, any NHI program should have a minimal impact on this problem. AMA officials urged that NHI be kept outside of the Social Security Administration.

The AMA delegation urged that controls not be reimposed on the medical profession, citing the AMA's urging of moderation by physicians to keep fees in line with expenses.

Other subjects at the meeting included manpower legislation, and Current Procedural Terminology.

The Food and Drug Administration is planning a letter to physicians alerting them to a series of studies to be published in *Lancet*, the British Medical Journal, that finds a higher-than-normal incidence of cancer of the breast among women age 60 and older who have been treated with Reserpine for high blood pressure. A panel of experts appointed by the HEW Department will review the data.

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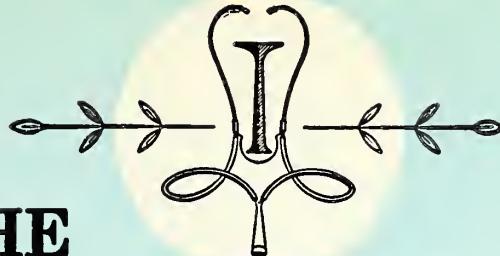
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For further information on this subject, the following references are provided:

1. Henry BW, et al: *Dis Nerv Syst* 30:675-679, Oct 1969.
2. Hollister LE, et al: *Arch Gen Psychiatry* 24:273-278, Mar 1971.
3. Claghorn J: *Psychosomatics* 11:438-441, Sept-Oct 1970.



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The JOURNAL of the KANSAS MEDICAL SOCIETY

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Address all correspondence to the JOURNAL OF THE KANSAS MEDICAL SOCIETY, 1300 Topeka Avenue, Topeka, Kansas 66612. Manuscripts should be submitted to the Managing Editor. Refer to "Information for Authors" for details.

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Open Letter to the Doctors of Kansas

Dear Doctor:

In this December issue, I wish to extend from our family to you and your family our very best wishes for a meaningful Christmas and a blessed New Year.

The Auxiliary "Funshop Team" just completed its schedule of visits over the state. I believe that we were able to personally contact many members who will make this arm of the Kansas Medical Society grow and excel. Since September, we have visited our members in Garden City, Dodge City, Hays, Caney, Colby, Kansas City, and Minneapolis. State officers have visited the county auxiliaries in Cowley County, Emporia, Topeka, Great Bend, Harvey County, and Wichita.

At the Fall Conference in Wichita, October 23-24, Auxiliary leaders from literally all corners of the state participated in a workshop with special attention to AMPAC and KaMPAC, and to state legislation. Drs. Rex Kenyon, of Oklahoma City, and H. Tom Gray, of Wichita, were the speakers. We were also honored to have Dr. John N. Blank greet us on behalf of the Kansas Medical Society and to introduce your representative from the KMS office, Mr. Jerry Slaughter. We stressed major Auxiliary emphasis on such topics as: genetic counseling, international health, education about health, and the Heimlich maneuver to dislodge the food and overcome "cafe coronaries." These were amplified by a Film Festival on eight different subjects, such as emergency medical services, VD, birth defects, self-

protection, and mental health. The films were shown and their use was suggested as program material for county auxiliaries and also for possible community programs.

This type of leadership training program provided an overview of Auxiliary interests and, hopefully, will help our local Auxiliary leaders demonstrate concern and guidance to their community in areas of health. These Auxiliary leaders appreciate that by being active in their own Auxiliary, they are being supportive of your profession. Your Auxiliary is the only organization promoting and supporting the activities of the Kansas Medical Society.

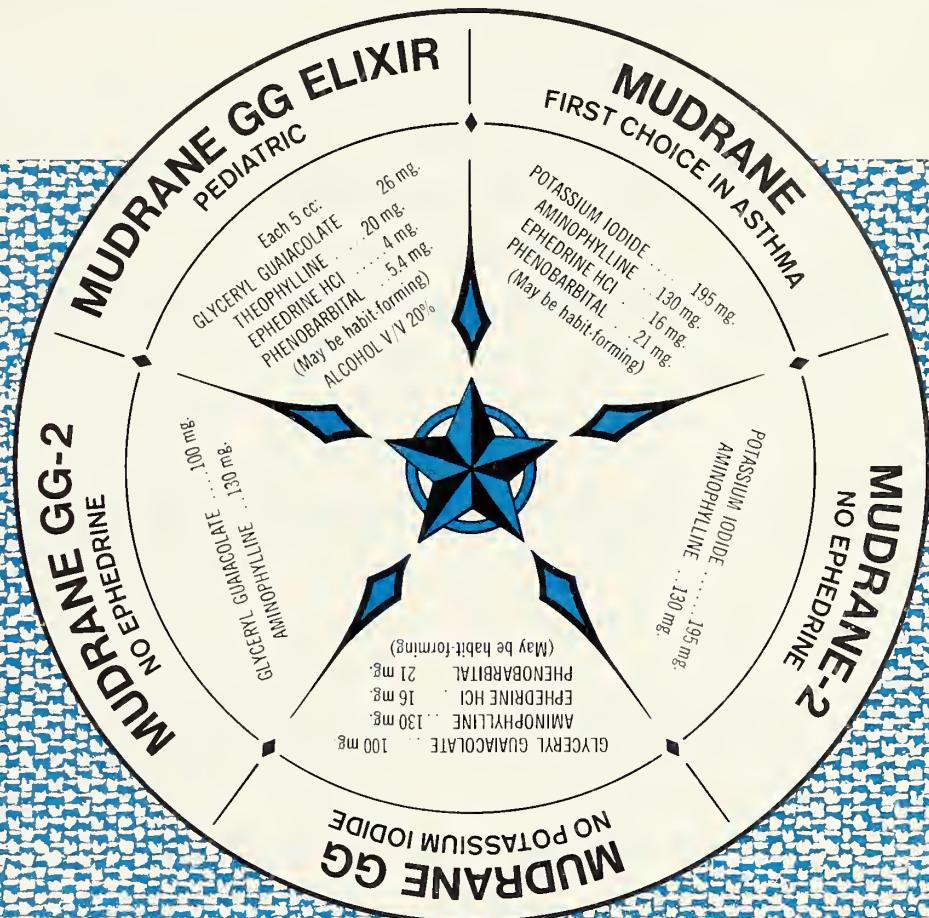
For their blessings, sacrifice, and encouragement to their wives' activities in the Auxiliary, I especially want to thank Drs. Emerson Yoder, Clair Cavanaugh, Dean Burnett, William Allen, Merlyn Colip, John Huff, John Rempel, W. G. Cauble, Paul Lovett, Evan Williams, Peter Wiens, Floyd Grillot, Kermit Wedel, William Crouch, and David Laury. A special thanks to Dr. Robert Moore, for allowing the "Funshop Team" to take over his home for our program. Finally, I want to thank what's his name, my husband, for much help and encouragement.

Doctors, your ladies thank you!

Dot Meyer
President,
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CONTRAINDICATIONS: Aminophylline/Theophylline is contraindicated in the presence of severe cardiac arrhythmias and patients with massive myocardial damage. Ephedrine, in presence of severe heart disease, extreme hypertension, and in hyperthyroidism. Phenobarbital, in porphyria and in patients with known phenobarbital sensitivity. Potassium Iodide, in pregnancy (to protect the fetus against possible iodine-induced depression of thyroid activity), in tuberculosis (produces gumma dissolution), and in acne; also in the presence of known iodide sensitivity. **PRECAUTIONS:** Aminophylline/Theophylline should be avoided in patients with massive myocardial damage and/or severe cardiac

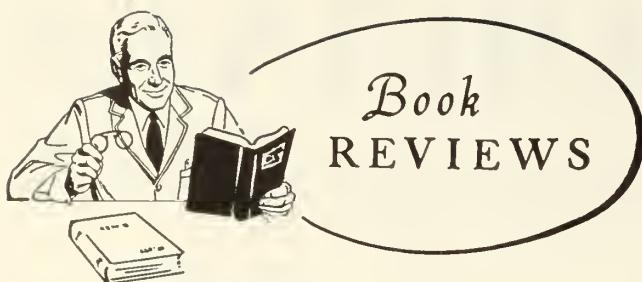
arrhythmias. In children, overdose may cause vomiting, cardiac arrhythmias, and severe agitation. Ephedrine should be used with caution in the presence of severe cardiac disease, particularly arrhythmias and angina pectoris; avoid in hyperthyroidism and severe hypertension. Phenobarbital may be habit-forming. Avoid overdosage. Potassium Iodide: Discontinue in the presence of skin rash, swelling of the eyelids and severe frontal headache. Long use may cause goiter. **ADVERSE REACTIONS:** Aminophylline/Theophylline may cause nausea, cardiac arrhythmias, and aggravate severe myocardial disease. It may cause headaches and tachycardia. Vomiting and dizziness are not uncommon. Ephedrine: In patients hypersensitive to CNS stimulation, ephedrine may cause nervousness, tachycardia, extrasystole and ventricular arrhythmias. May cause urinary retention, especially in the presence of partial prostatic obstruction. Psychoneurosis may be aggravated. Pre-existing anginal pain will be aggravated. Phenobarbital may produce severe skin rash. Avoid overdosage. May be habit-forming. Potassium Iodide may cause nausea. Over very long period of use, iodides cause goiter. Discontinue if patient develops skin rash, eye irritation, eyelid swelling, or severe frontal headache.

HOW SUPPLIED: Mudrane and Mudrane GG available in bottles of 100 and 1000 tablets; Mudrane-2 and Mudrane GG-2 in 100s; Elixir in pints and half-gallons.

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Book REVIEWS

PRINCIPLES OF CLINICAL ELECTROCARDIOGRAPHY, 8th Edition, by M. J. Goldman, M.D. Lange Medical Publications, Los Altos. 1973. 400 pages. \$8.00.

The basics of electrocardiography are extremely well presented in this paperback text. There are a multitude of representative electrocardiograms used, and these are well pointed up with diagrams and explanations of the cardiac conduction systems and lesions that are involved. The early chapters of this book have to do with the electro-physiology of the heart, vectors, and the normal electrocardiogram in both adults, infants, and children. The remaining chapters are concerned with abnormal electrocardiographic patterns and the various common disease patterns. There is a fine introductory chapter regarding vector-cardiography, and the final chapter offers the reader a chance to review and interpret many various electrocardiographic patterns.

In his introduction, the author points out the fact that the electrocardiogram is a laboratory test only and like all laboratory findings, an electrocardiogram is significant only when interpreted in the light of clinical findings. Therefore, the individual most qualified to interpret the ECG is the physician caring for the patient.

In the chapter concerning intraventricular conduction defects, there is a good explanation of the hemiblocks and the peripheral left ventricular conduction defects. These are particularly well diagramed and well explained.

The subjects of myocardial ischemia and myocardial infarction are covered rather comprehensively and as is typical of this book, are well diagramed according to conduction involved and with many representative tracings. The usual atrial and ventricular arrhythmias along with atrio-ventricular conduction disturbances are discussed and presented quite adequately.

Various other abnormal electrocardiographic patterns are presented, including the following: pericarditis, myocarditis, hyper- and hypothyroidism, traumatic heart disease, neuromuscular diseases, malignancy of the heart, electrolyte disturbances, and the effects of various drugs on electrocardiogram.

In summary, the reviewer feels that this book is an excellent guide to the basics of electrocardiography and

that both the medical student and the practitioner will find it to be a valuable guide.—*J.P.B.*

ATLAS OF VASCULAR SURGERY, 3rd Edition, by Falls B. Hershey, M.D. and Carl H. Calman, M.D. The C. V. Mosby Co., St. Louis. 1973. 504 pages, 681 illustrations. \$35.00.

This comprehensive atlas of vascular surgery is an excellent text. The chapters on vascular surgery history, surgical principles, and general basic techniques (with appropriate illustrations, theory, techniques, principles of vascular flow, etc.) are especially well done and illustrated. The book is well organized and indexed.

The authors, in their introduction, frankly admit to certain strong feelings regarding the proper approaches to specific problems, and the reader must appreciate this fact. This is not necessarily a weakness, but the reader must be aware of this. Perhaps the weakest chapter in the entire volume is that devoted to arteriography. Numerous modifications and major improvements in the area are not even mentioned by the authors.

Vascular surgeons all realize any text on this subject is inevitably outdated in certain areas long before its publication; however, the many procedures and diagnostic techniques which have been well worked out are very adequately reviewed and for the most part beautifully illustrated.

The reviewer feels that this vascular atlas is the best available book in this field and would be very helpful, especially to surgical interns and residents.

Any hospital library, or anyone learning or doing vascular surgery, would be well advised to have this book for its basic information content, as well as for the author's views on specific subjects.—*W.J.V.*

IMMEDIATE CARE OF THE ACUTELY ILL AND INJURED, edited by Hugh E. Stephenson, Jr. The C. V. Mosby Co., St. Louis. 1974. 266 pages.

This book is well organized and covers all aspects of the subject material. However, it is too superficial in many areas to be used as a textbook for medical students. As an example, in the area of cardiac arrhythmias, the book does not include the use of electrocardiograms.

(Continued on page 16)



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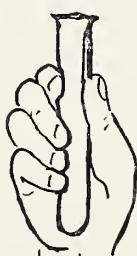
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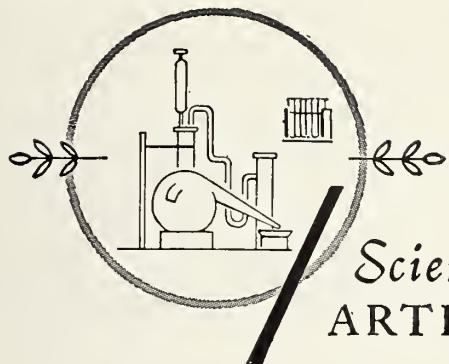
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Scientific ARTICLES

Civilian Aeromedical Transportation

Medical Indications and Contraindications

JOSEPH A. MOYLAN, M.D., Madison, Wisconsin

LITTER BEARERS accompanied the armies of Rome and Greece, and transported on foot the afflicted soldiers to the field hospital. Providing rapid access for the critically ill or injured patient into the appropriate medical care system has been a major concern to physicians through the centuries. From the Middle Ages until now, ground transportation for ill patients has been the primary mode of medical transportation, initially by animal-drawn vehicles and now by modern ambulance.

With the Vietnam conflict, a new method of conveyance of ill patients reached its peak—aeromedical transportation. Prior to that time, air evacuation was primarily used to transport healed but convalescent soldiers from the overseas hospitals to a treatment center in the United States. Although helicopter use was employed during the Korean war, the full value of this technique was not appreciated until the 1960s. During this period, the mortality rate for war injuries was significantly reduced. The major factor for this reduction in the death rate was rapid transport of the injured. No soldier was more than 35 minutes away from a medical facility capable of giving definite resuscitative life-saving treatment.¹

This military experience has been translated into civilian practice. Although some question the value of the helicopter in civilian medicine, many reports have documented the life-saving aspects of aeromedical transport.

It is important, in considering air medical transportation, to distinguish three main types utilized in the system: (1) Aeromedical transportation from the accident scene to the hospital. In this situation, one is transporting

Medical indications and contraindications to air evacuation are described. Personnel, equipment requirements, and patient preparation necessary to insure a controlled conveyance of ill and injured patients is outlined.

a labile patient who has just incurred an illness or an injury to the primary facility. (2) Interhospital transportation, where a patient once stabilized is diagnosed as having a disease process requiring specialized medical care. (3) Materials transport, including the movement of matched blood from a central blood bank to rural hospitals.

The transport of the patient from the accident scene to the hospital has received much publicity in recent years. Actually, the experience with interhospital type of transportation has been much more extensive. The personnel at the U. S. Army Institute of Surgical Research have been involved in air evacuation of acutely injured patients since 1951.² While sporadic missions of mercy have been carried out for many years before that time, no accurate records of problems and special requirements for aeromedical transportation had been kept. During a recent three-year study period, approximately

Assistant Professor of Surgery, University of Wisconsin Center for Health Sciences, 1300 University Avenue, Madison, Wisconsin 53706.

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250 flights were undertaken involving 765 patients. Within 48 hours of injury, 31 per cent of the patients were evacuated to the Army Burn Center. The others were transported from as far away as Japan during the first postburn week. In all instances, the patients were initially stabilized at the primary treating hospital, and then referred to the Army Burn Center in San Antonio.

Another dimension that must be considered in the aeromedical transportation scheme is the type of "flying machine." The first, the rotor type helicopter, is more commonly used in Type I evacuations from the scene of the accident to the hospital, although this airplane has been used in interhospital transportation up to a radius of about 200 miles. The fixed-wing plane, either prop or jet type, is more commonly used in Type II transportation.

Type I Aeromedical Transportation

The major indication for Type I aeromedical transportation is that the transport phase from the point of onset of the illness or injury to the hospital is less, using an airplane than the ground transportation phase.

A second indication for Type I use is the accident scene identification of patients with special care requirements. Examples would be patients with major burn or spinal cord injuries. In these instances it would be better to transport the patients, if stable, to the specialized care center than to the nearest primary care facility.

There are two medical contraindications to Type I evacuations. The first is the availability of a better transport method for a particular illness. It is probably better to transport a patient with a heart attack in a mobile coronary care unit which is fully staffed and has monitoring and treatment capabilities. However, it must be appreciated that these sophisticated ground vehicles are not widely available. Another contraindication to Type I evacuation is turbulent weather. It has been well documented that external stress phenomena produce increased cardiac irritability and arrhythmia. During turbulent weather it may be safer to transport the cardiac patient in a ground ambulance.

In addition to the flight crew, there are some personnel requirements which are necessary to provide adequate care for acutely ill and injured patients transported from the scene of illness to the hospital. Evaluations of ambulance effectiveness have demonstrated that not only response time of ambulance service, but also the initial and continued treatment en route is important in reducing the morbidity and mortality rate.³ Each Type I flight team should include an emergency medical technician who has advanced EMT training. This paramedic should be capable of controlling major hemorrhage, in-

tubating patients with cardio-respiratory arrest, performing CPR, and under a physician's direction via radio communication he should be able to start an I-V and administer intravenous medications.

Many existing Type I aeromedical transportation systems in the United States have utilized registered nurses and physicians as members of the medical team.⁴ As the advantages and disadvantages of including physicians and nurses in Type I evacuation teams have not been fully ascertained, it is not proper to make them required medical team members at this time.

Certain equipment must be available to the medical team in order to be able to provide life-saving initial resuscitation. This includes a drug box containing the medications needed for treating cardiac arrest and shock—including such drugs as sodium bicarbonate, vaso-depressor agents, cardiotonic agents, and others. Since some of the patients transported may suffer from myocardial infarction and arrhythmias, both monitoring and defibrillating equipment should be available. Other commonly required equipment includes endotracheal tubes, a laryngoscope, pneumatic splints, blood pressure cuffs, and bandages. Both 5% dextrose in water and Ringer's lactate should be available to start I-V. Plasma and other colloid type expanders have limited use in this initial phase of resuscitation, and they are not necessary. Good suction equipment is extremely important. Either a foot- or electricity-powered suction equipment could be used. Oro-tracheal suction is frequently necessary following accidents, as secretions accumulate in the upper airways reducing respiratory exchange.

In preparing patients for Type I evacuation, or from the accident scene to the initial hospital, an adequate airway should be assured, hemorrhage should be stopped by whatever means necessary, and fractures temporarily splinted and the patient well secured to a stretcher before the flight is undertaken. An initial evaluation should be completed again prior to takeoff, as complications are often difficult to diagnose or treat during flight because of noise, limited space, inadequate light, and aircraft motion. Rapid transport to a medical facility of severely injured patients by trained personnel will not only decrease the interval from time of injury to institution therapy, but will also reduce the morbidity and death rate of patients with multiple trauma or major illness.

Type II Aeromedical Transportation

Type II, or interhospital transportation, involves the transport of critically ill patients from one hospital to another. Primary indication for this type of evacuation is the need for specialized care not available at the initial hospital. Examples include neonatal centers for

premature babies, spinal cord centers, burn centers, and trauma centers for the patients with multiple injuries. The advantages of increased use of specialized care units are a reduction in mortality and morbidity rate to these critically ill patients, and also a reduction in the medical costs required to maintain these specialized centers because of increased utilization.

Since evacuations later in the post injury period are usually over longer distances, proper assessment of the resources available support requirements of the patients, and particularly any contraindications to the evacuation should be made. Many factors enter into this consideration. First of all is the space available in the airplane relative to the types of support equipment that the patient needs. Patients with acute respiratory failure may require a volume respirator, such as Byrd's, rather than a pressure respirator to maintain adequate oxygenation. Space in the plane may not be available for such a piece of equipment. It would be foolish to attempt to transport a patient without the necessary life support equipment. At our present stage of mechanical development, respiratory equipment is the major limiting factor as far as portable support equipment is concerned. Monitoring requirements are involved with patients with cardiac arrhythmias or individual patients in profound shock in whom interarterial monitoring is necessary. Increased technology in monitoring has markedly reduced limitation of cardiac monitoring. Miniature self-power monitors are available.

The primary concern in the patient being transported over long periods of time are the medical contraindications. Air transportation of patients with pneumonia or acute congestive heart failure is extremely hazardous because of alterations in atmospheric pressures. At an altitude of 30,000 feet, the cabin is pressurized to approximately 5,300 feet above sea level. Lowered atmospheric pressures may produce significant hypoxia and its sequellaes in patients with impaired oxygenation, in spite of nasally administered oxygen. In addition, it has been found that preexisting pneumonia appears to rapidly progress in this group of patients following aeromedical evacuation. The use of continuous positive pressure by a tracheostomy tube may be helpful to patients with hypoxia if portable respiratory equipment is available. In addition, restricting the ceiling altitude of the plane may minimize the effects of lower atmospheric pressure.

Cardiac arrhythmias should be controlled prior to attempting an evacuation by air. Since monitoring of the apical heart rate and blood pressure is difficult in flight because of noise and vibration, portable self-contained cardiac monitors have been used during ground

vehicular transportation and may be of value during air movement, but experience with their use is lacking. The usual indices of cardiovascular stability which can be monitored during air transport include a palpable distal pulse, respiratory rate, and the hourly urine output.

Recent gastrointestinal bleeding, especially from stress ulceration, is a relative contraindication to Type II evacuations involving long distances. Massive bleeding during flight may be uncontrollable, and the transport of large volumes of matched blood is often impractical, because the refrigeration equipment required for safe blood storage is usually not available. Should bleeding develop during flight, vigorous therapy should be undertaken, including iced saline lavage of the stomach.

Uncontrolled hyperthermia is another contraindication to aeromedical evacuation. If the fever cannot be controlled adequately by anti-pyretic agents, the air transportation of that patient should be delayed until the cause of fever can be treated. Present day hyperthermia equipment is too bulky to permit easy transport with the patient during his air evacuation.

Proper patient preparation for air evacuation is of prime importance to insure safe transport of critically ill individuals. Multiple parameters should be carefully assessed prior to the evacuation. Important laboratory indices include a blood glucose to identify the patient with glucose abnormalities and potential hyperosmolar coma; electrolytes in order to avoid cardiac arrhythmias secondary to hypokalemia; and a hematocrit to assure that the patient has adequate oxygen-carrying capability even at potentially reduced atmospheric pressure. A chest x-ray should be obtained on all critically ill or injured patients prior to air evacuation, to rule out a pneumothorax which may become worse during transportation, or an unsuspected pulmonary parenchymal disease. An electrocardiogram in adult patients and those with chest injuries will be helpful in diagnosing cardiac irregularities.

The factors of patient care which must be considered prior to an evacuation include the following.

In patients with ileus, coma or sepsis, a nasogastric tube should be inserted prior to the evacuation. With decreases in atmospheric pressure, progressive expansion of the intestinal gases may result in an emesis and even aspiration of the intestinal content. In addition, during ascent and descent of the plane, a risk of emesis is incurred by the patient in the supine position with marginal gastric activity. Intestinal decompression with a nasogastric tube will prevent an avoidable catastrophe in these instances. Large volumes of fluid by mouth immediately prior to air transport should be avoided, as nausea and motion sickness are common in ill patients or

may develop during takeoff and ascent through turbulent altitudes.

When intravenous fluid administration of medications is required during this transportation phase, the intravenous catheter should be well secured to prevent inadvertent removal during transportation. The use of a skin suture to hold even percutaneous I-V in place is advised. If large volumes of fluid are required, a centrally placed catheter should be utilized, as the height of the intravenous column may be limited by cabin space. Air pressure lock is more common at lowered atmospheric pressure with sidearm venting fluid administration sets. Additional venting, using a large-bore needle, may be required when these sets are employed.

The use of a tracheostomy prior to air evacuation should be considered in patients with facial and neck trauma if airway obstruction is likely to develop during transport, particularly if a physician is not able to accompany the patient during the flight. While endotracheal or nasotracheal tubes have reduced the need for tracheostomy in the controlled medical environment, reintubation during flight may be extremely difficult even in the most skilled hands, because of limited space and preexistent edema from trauma. Performing a tracheostomy in flight is an extremely formidable procedure under these conditions. A secure tracheostomy done in a controlled hospital environment prior to flight may be life-saving in some of these patients. The risk of extubation and its complication should be considered in each patient.

Maintenance of body temperature should be insured during evacuations in spite of variations in environmental temperature. Army experience has shown that the universal protective dressing developed by the National Research Council is a particularly effective means of body temperature control. It offers additional benefits of an excellent absorptive surface for patients with large exudative wounds such as burns, intestinal fistulas, or compound fractures. The water-repellent outer layer prevents contamination from external sources, and this dressing is available in a sterile package. The dressing can be applied and held in place with roller gauze, and is easily applicable to a variety of trauma patients. Patients without external wounds may be covered with hospital blankets in appropriate number to minimize heat loss.

The army field stretcher is well suited to air evacuation, can be easily stored aboard the aircraft when not in use, and can be secured to many different types of aircraft when employed in an air evacuation. The patient should be securely fixed to the transporting stretcher since turbulent weather may be encountered in flight.

Use of multiple circumferential straps insures patient stability and will prevent additional injury during transport.

As these patients are critically ill and extremely labile, a special medical team is required for interhospital transport. As a minimum, a registered nurse who is well trained in intensive care unit techniques should accompany this patient. This nurse should not only be able to carry out life-saving resuscitation, but must also be capable of diagnosing and treating unexpected complications. In many instances it may be not only advantageous but necessary for a physician to accompany this critically ill patient, particularly if multiple complications already exist. A respiratory therapist skilled in regulating respirators may be an additional valuable member of this team if the patient is intubated and requires continuous pulmonary support.

Since this transfer is in effect an extension of intensive-care-unit patient care, the equipment requirements are much more extensive. Many large steel chests may be necessary to transport all the equipment, as it is usually necessary to bring special equipment to the referring hospital. These chests should be particularly rugged, so as to tolerate many movements from the airplane to the hospital and back again. The equipment requirements are basically what one stocks in the average intensive care supply area, including a minor suture set to control hemorrhage, a tracheostomy set, a dressing set, a cut-down set, gloves, and dressings. A Foley catheter, urometer, and Toomey syringes should be available to treat bladder distention and monitor urine output. In addition to the usual dextrose in water and electrolyte solution, a colloid volume expander should be included.

The medication kit includes not only medications to meet an unexpected cardiac arrest, but also the other life-threatening complications that critically ill patients develop. Sterile and unsterile treatment supplies are required, as treatment initiated in the hospital must be continued especially during long flights. The resuscitation kit includes multiple sizes of tracheostomy and endotracheal tubes, suction catheters, an amber bag, and a pressure respirator.

As most planes are not equipped to control humidity closely, evaporative water losses via the respiratory tract in skin may be increased. Additional fluids should be included to offset these losses during long flights, and should be individualized for each patient. Monitoring the hourly urine output is a useful guide to adequate fluid replacements during these flights.

Proper positioning of the accompanying medical personnel is extremely important. These attendants should

(Continued on page 352)

Pre-Hospital Management

Head and Neck Injuries

DONALD J. PROLO, M.D.,* *Stanford, California*

PROGRESS in the care of patients who have sustained injuries to the head and neck has been a medical triumph of this past century. Trephination, as practiced by the prehistoric stone age cultures, was continued through the years of Hippocrates (460-357 B.C.), Paré (1510-1590), and Astley Cooper (1768-1841).¹ In the latter part of the 19th century, practice depended upon the major advances in anesthesia, bacteriology (antisepsis, asepsis), and cerebral localization for the means of reversing an otherwise inexorable demise.

Hippocrates knew that the limbs below a spinal dislocation became paralyzed; and Ambroise Paré, a pivotal figure in the history of surgery, exposed the dura and roots during his military service for the King of France; Harvey Cushing operated on specific categories of spinal injuries during World War I. Most of those patients could not expect long-term survival. It was during and since World War II that further understanding of the mechanism of injury to the spine and its coverings, surgical fusion, the advent of complex rehabilitative practices, and the availability of antibiotics have conducted to nearly normal life expectancy for such patients.

Fighting men learned early the effectiveness of disabling an adversary with a head wound. It is paradoxical that the most significant progress in managing patients with head wounds has been associated with the wars of this century. Whereas soldiers on the battlefields of Antietam and Gettysburg fatalistically and realistically expected death from cerebral gunshot wounds, those who fought at Iwo Jima and Hue have most often survived such injury. From his experiences during World War I, Cushing² demonstrated that the most important factor in reducing the toll of military craniospinal trauma was immediate, definitive hospital care. The importance of reducing the time interval between the occurrence of head and neck trauma and the arrival in the operating room has been recognized in civilian cerebral gunshot wounds.

About 145,000 people die every year in the United

States as a direct result of trauma, of which 112,000 are accidental or unintentional; 21,000 are from suicide; and 12,000 result from homicide. Motor vehicle deaths account for about 55,000 of the total deaths, and 70

The pathophysiological mechanisms of trauma are discussed, and prevention of the mishandling of the patient prior to his arrival at the hospital is outlined.

per cent of highway fatalities result in injury to the brain. Moreover, injuries to the head, and head and neck are the most frequent causes of death from falls.³

Basic Mechanisms

In order to maximize the likelihood of recovery from an injury to head or neck, one must correlate methods of management with the pathological processes which are occurring in the victim as a result of the injury. The events set in motion at the time of injury to brain and spinal cord are being intensively investigated today with the prospect that major new techniques of early management will further reduce the disability from these injuries. The corollary urgency of careful, expeditious pre-hospital management becomes clear as methods are introduced to arrest secondary neural injury which is not a direct result of the initial trauma. What are these pathophysiological mechanisms?

At the time of experimental cerebral concussion in a subhuman primate apnea, areflexia, and asystole occur.⁴ Soon, bradycardia is seen on the electrocardiogram which reflects massive vagal discharge. The usual course of apnea lasts 5-60 seconds. After 30 seconds cardiac irregularities begin to appear leading eventually to ventricular fibrillation and arrest if apnea persists. Concomitantly, central venous pressure rises with the persistence of hypoxia and hypercapnia. These functions revert toward normal with the first inspiration, unless the epiphrenomena of head trauma (hemorrhages, clots, etc.) develop within the cranial cavity. This early intracranial pressure rise is related to vascular engorgement rather than cerebral edema, and returns to normal within

* Clinical Assistant Professor, Division of Neurosurgery, Stanford University Medical Center, Stanford, California 94305.

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Address reprint orders to: D. J. Prolo, M.D., 1163 Crescent Drive, San Jose, CA 95125.

5-10 minutes. If further complications are superimposed upon the simple concussion, in the form of a contusion leading to brain swelling or hematoma formation, the volumetric increase in one of the intracranial compartments leads to a secondary rise in intracranial pressure, followed by increasing blood pressure, slowing of pulse, and respiratory irregularities. With continuing increase in intracranial pressure, respiration becomes depressed, further acidosis and edema eventually lead to cerebral vasoparalysis and apnea. These observations by Ommaya⁴ in primates have been documented by Langfitt,⁵ and others, in humans.

With increasing intracranial pressure, pulmonary function becomes more and more compromised by complex mechanisms which include decrease in pulmonary compliance, ventilation-perfusion inequality, arteriovenous shunting, and eventually pulmonary edema. Aspiration of vomitus compounds the problem further. These complex factors account for the finding that at the time of arrival in the emergency room, about one-half the patients with head and spinal injury are hypoxicemic (PO_2 below 80 mm Hg).⁶ Many of these systemic consequences of injury reflect a massive output of catecholamines.

Over the past few years, there has been a resurgence of interest in the monoamine neurotransmitters in the pathophysiology of brain and spinal cord injury.⁷ This has followed the observation by Osterholm and Mathews,⁸ that hemorrhagic necrosis of the spinal cord follows injection of norepinephrine into the spinal gray matter of cats, and that after a 500 gm/cm force injury the cord of cats has an increase in norepinephrine.⁸ Previously, Allen in 1908, had reported that after spinal injury there is a hemorrhagic necrosis of the central gray matter. Cystic and vacuolar changes then extend into the white matter, which have been considered secondary to ischemia, vascular stasis, hypoxia, and edema. When brain or spinal neurons become ischemic as a consequence of emboli, thrombi, or vasospasm that can follow trauma or hemorrhage, these neurons can then "leak" various intracellular constituents that are stored in high concentration. The monoamine neurotransmitters—for example norepinephrine, dopamine, and serotonin—may cause further ischemia, and then damage to the spinal cord progresses.⁹

There are some variances in the monoamine found increased at the site of spinal cord trauma. For example, Hedeman *et al.*¹⁰ at the University of Kansas, have found that dopamine, not norepinephrine, rises at the site of spinal trauma in the dog. These workers¹¹ have furthermore demonstrated that a high degree of clinical protection was afforded by phenoxybenzamine, an alpha-

adrenergic receptor blocker, and a lesser degree of protection from haloperidol, a dopaminergic blocker and low molecular weight dextran. Efforts to protect the spinal cord from this early secondary progressive white matter ischemia, extending centrifugally from the area of central gray hemorrhagic necrosis, have included midline myelotomy, rhizotomy, hyperosmolar dehydrating agents, hypothermic perfusion, normothermic perfusion, steroids, antifibrinolytic therapy, hyperbaric oxygen, and anti-serotonin therapy.⁷ None of these techniques has been rewarding, but indicates the direction therapy will follow in the immediate future.

The interval between impact and arrival in the emergency room is crucial. In a large series of Edinburgh fatalities,¹² 25 per cent of fatal complications could be related to the period before arrival in the emergency room.

In any series of head injuries, there is a coincidence of cervical fractures and dislocations which may be as high as 10 per cent.¹² The association of serious neck injuries with head trauma reinforces the clinical maxim that before an accident victim is moved, consideration must be given to possible cervical spine injury. Once the patient reaches the emergency department, an x-ray encompassing the entire cervical spine in lateral projection must be obtained. Inept handling and careless disregard for these procedures have rendered quadriplegic, with all the ramifications of that condition, some patients with unstable cervical spine fractures or fracture dislocations.

With this background, it is somewhat surprising that more attention has not focused on the immediate minutes after impact. In many communities, poorly trained ambulance attendants or firemen risk the entire future of the accident victim. Furthermore, instrumentation to protect the patient with head and neck injuries has lagged unnecessarily behind knowledge that a small movement may irreparably injure the vulnerable spinal cord. Frequently, inept or concussed victims are "immobilized" with sand bags. First, the patient is moved from the position of injury to a litter. On arrival in the emergency department, he completes his second transfer to a hospital stretcher and, subsequently, is moved a third time to an x-ray table. The patient is frequently left unattended as the nurse, physician, or x-ray technician completes some other task. During all these transfers, and through the entire period of time from impact through transportation, evaluation and x-ray, before definitive care including immobilization with tongs is introduced, the patient may suddenly become paralyzed if the unstable bone fragments directly compress the spinal cord, or if a small movement of the bone should suddenly compromise blood supply to the spinal cord or

brain stem.¹³ While there are no satisfactory means of protecting the spinal cord from the early biochemical effects of injury, devices are available which prevent secondary mechanical or vascular disruption of the spinal cord by its surrounding vertebral encasement.

Cervical Stabilization-Traction Board

To accomplish safe efficient transport of the patient with an injured cervical spine, ambulance companies and emergency rooms in Santa Clara County, California have used a new device. It allows immediate stabilization in traction of the patient at the accident site. No transfers are necessary through x-ray determination until definitive care is begun or a fracture has been excluded. All head injuries are regarded as potential cervical spine injuries; the cervical stabilization-traction board (*Figures 1 & 2*)¹⁴ is therefore used in most cases of trauma.

By two shoulder straps and one waist strap, the patient's trunk is immobilized on the board. The positions of these binding straps allow ready access to chest and abdomen in case resuscitative efforts become necessary; ventilation is unimpeded. Two movable blocks which rotate on three axes are placed along the patient's biparietal convexity above the ears. The head may thus be immobilized in the position it is found, and lateral and rotational movements of the head are prevented. A halter sling is

attached over clam cleats placed over the back of the blocks to provide some traction and prevent flexion movements. Prompt disengagement of the patient is possible. Awake patients have attested to the comfort of the device.

Community Responsibility

A community depends upon its physical resources to implement care and insure a satisfactory outcome after a potentially catastrophic accident. In most areas, ground transportation ambulances, hopefully of sufficient size to allow working room, will remain the principal means of conveyance, rather than helicopter or airplane. Where distances are longer in rural areas or congestion disallows rapid movement of the victim through city traffic, air ambulance will be necessary. The critical importance of helicopter transportation in Korea and Vietnam has been stressed in reducing morbidity and mortality.^{1, 15}

A community depends even more upon the expertise of its emergency personnel to manage high risk crises and potentiate recovery. Physicians must understand the basic anatomical and pathophysiological events that occur during and immediately after trauma. Nurses, firemen, and ambulance attendants must be familiar with these mechanisms and be trained to perform rapidly, carefully, and skillfully under emergency circumstances. This necessitates training and re-training classes, and regular practice under relaxed nonemergency conditions.

Summary

Through the centuries, injuries to the brain and spine have been almost invariably fatal. Over the past 100 years, the neurosurgery of trauma has advanced to the

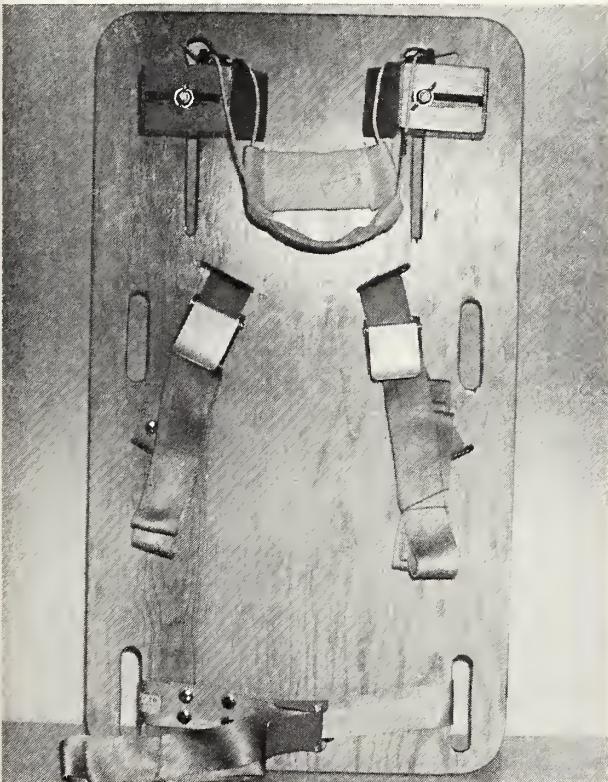


Figure 1



Figure 2

point where only a few die from these injuries. The quality of survival now becomes of greater importance than the presence of life.

We stand on the threshold of advances which may transform the ultimate consequences of these injuries by protecting the sensitive central nervous system tissue from the secondary effects of injury. These considerations signal the importance of pre-hospital management: careful handling, expeditious safe transportation in a cervical stabilization-traction board, and immediate definitive therapy.

Ambroise Paré was wont to say, "I dressed him and God cured him." The latter remains true, but our present resources permit some influencing of the issue.

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Civilian Aeromedical Transportation

(Continued from page 348)

be closely positioned to insure continuous observation of critically ill patients. The emergency resuscitative equipment should be in a position near the patient and be ready for use, should any medical catastrophe develop.

Summary

With proper planning, careful selection and suitable preparation of the patient, critically ill and injured individuals can be safely transported by air both from the initial site of the injury to the primary treatment facility, and later to a medical center with specialized capabilities for treating major trauma or complicated medical illnesses. Increasing use of aeromedical transportation will improve the delivery of coordinated medical care to critically ill and injured patients, and permit maximum utilization of specialized medical units.

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The Journal of the Kansas Medical Society

Medical Aspects of Trauma

Trauma and the Internist

SIMON SEVITT, M.D., *Birmingham, England*

TRAUMA has for generations been regarded as the prerogative of surgeons, and surgeons must continue to have a major role in the treatment of traumatic conditions; but times are changing, and the field of trauma has become too large and too complex to be left to surgeons alone—the skill and mode of approach of various specialists are now required. Most surgeons will agree that effective teamwork is necessary for the proper understanding and care of seriously injured patients. Physicians have much to offer from their experience gained in other fields of medicine. The title "physician" is used here in the British sense, corresponding with the title "internist" in North America.

Magnitude of the Problem

In advanced countries like Britain and the United States, violence has become a major cause of death. In Britain, it is the fifth most common cause after ischemic heart disease, malignancy, cerebrovascular, and respiratory diseases. In the USA it is the fourth most common cause. In Britain, the annual number of deaths due to traumatic injury is about 14,000, and in addition there are about 700 deaths from burns and scalds. Some 7,000 to 8,000, are the result of road traffic accidents, which alone are now the leading single cause of death in males of up to 40 years of age. This compares with some 53,000 highway deaths per year in this country, with eight times the vehicles and four times the population of Britain. In West Germany, which has a similar population and number of vehicles as Britain, there are 17,000 traffic deaths a year. Industrial accidents of course are also important.

Fatality, however, is only part of the story. British official estimates have shown that the number of hospital inpatients treated for injury exceeds 500,000 per year. Accident cases account for at least 10 per cent of the total patients admitted to hospitals. New outpatient attendance in accident and emergency departments of hospitals number over 8 million per year, of which some 60 per cent, or nearly 5 million, are injured persons.

Pathology Department, Accident Hospital and Rehabilitation Center, Birmingham, England.

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Thus, in Britain, millions of people are sufficiently injured to attend hospital, more than one-half million become inpatients, and more than 14,000 die each year.

Pre-existing medical diseases and complications following trauma are discussed. The role of the internist in the modern care of the traumatic patient is outlined.

Of course, many deaths, especially road deaths, occur at the scene of the accident or soon after, so that many never reach the hospital alive.

Medicine in Trauma

The medical aspects of injury may be divided into two main, though overlapping, parts: (1) Systemic or general body reactions to injury; and (2) Complications of injury.

The systemic reactions have great physiological content, and their study has widened knowledge related to homeostasis and various interrelated body mechanisms.

Systemic Reactions to Injury

All severe injuries are followed by a series of complex and often interacting changes which affect tissues and organs remote from the site of insult. The reactions involve the nervous system and endocrine activity; they promote various metabolic changes, alter cardiovascular mechanisms, and induce effects on renal function, leukocytes, the coagulation and fibrinolytic mechanisms, and probably all body systems. Many are part of an integrated series, though sometimes the various causes and effects are difficult to unravel since one body system may be affected by or produce changes in the others. Thus, the acute reduction in blood volume following hemorrhage and severe injury is responsible for much of the circulatory disturbance, known as shock, and for post-traumatic anemia, but it is also a sustaining cause of excessive adrenocortical activity responsible for sodium retention.

Many effects of injury are obviously harmful, such as

severe hemorrhage, but many others, like hemodilution after hemorrhage, may be teleologically considered as defense mechanisms. However, their benefit is limited, and beyond a certain point some give rise to pathological disorder. Man, however, may be able to improve on nature's limitations by prophylactic methods of increasing the resistance of the body to injury. This is a long-term challenge, though there are hints in the experimental literature which indicate that the proposition is not outrageous.

The division of posttraumatic effects into physiological responses, which should not require active intervention, and pathological sequelae, which need to be prevented or treated, can be useful for clinical purposes. Yet the division is not always easy and there is a borderland zone between physiology and pathology.^{1, 2}

Borderland phenomena include:

1. Physiological effects; that is, harmless or beneficial changes which become pathological with prolonged or excessive action.
2. Certain reversible pathological changes which may become irreversible.

Examples include the following phenomena:

Renal vasoconstriction which may culminate in necrosis of tubules;

The onset of hypoxia of the central nervous system may be a transitory period of hyperexcitability and activity culminating in depressed activity;

A relatively harmless phase of pulmonary fat embolism may be followed by systemic fat embolism with its danger of serious cerebral effects.

The transformation to overt pathological or to irreversible effect often obeys the dialectical law of change from quantity to quality. Thus, serious or even fatal disorder may occur when the duration or the degree of effect exceeds a biological limit. Oxygen debt due to the reduction in the carriage of arterial oxygen from traumatic shock is a relevant example.

The questions of physiological and pathological reactions to trauma and the various borderland and ill-understood phenomena are discussed more fully elsewhere.² Further discussion here is limited to some aspects of two phenomena: subendocardial hemorrhage and the perplexing problem of posttraumatic hyponatremia.

Sub-endocardial hemorrhage. This is a common finding in injured patients who reach necropsy, though its mechanisms and significance give rise to debate.

Streaky, often confluent hemorrhages are found under the endocardium of the left ventricle only, most commonly over the interventricular septum, though sometimes also over papillary muscles and elsewhere (*Figure 1*). Subendocardial hemorrhages were found in about



Figure 1. Sub-endocardial hemorrhagic "shock lesion" in a patient who died 6 hours after a head injury.

70 per cent of those who died within 12 hours of a road accident.³ Similar lesions can be produced in animals bled to severe hypotension, and are also found in some burned cases. They are also seen in non-traumatic cases, especially in obstetric shock in those with acute intracranial lesions.

Certain facts suggest that the lesion occurs shortly before death rather than soon after trauma; the lesions are always fresh and there is never evidence of red cell breakdown. This suggests an agonal origin, without special significance to the cause of death. On the other hand, the location of the hemorrhages around the high-pressure outflow tract of the heart, and their relationship to the distribution of Purkinje's fibers, points to the possibility of significant cardiac dysfunction. The causal factors suggested for the phenomenon include sudden restarting of contraction after transient arrest, mechanical damage of the sub-endocardium from vigorous contraction of an incompletely filled ventricle, anoxia of sub-endocardial capillaries, and sympathetic overactivity.

Further work, both experimental and clinico-pathological, is needed to clarify the role and pathogenesis of this lesion. The contribution of cardiologists could be of value.

Hyponatremia. It has been known for years that the plasma levels of sodium and chloride fall after injury and burning, and this is associated with urinary retention of these ions and increased excretion of potassium. Usually, the changes return to normal in a few days, but sometimes they persist and recur. Hyponatremia in the face of sodium retention is a paradox. Total body sodium is

unaltered so that sodium is re-distributed between the cellular and extracellular water. Cellular sodium must rise as sodium levels in the plasma and interstitial fluid fall; and water must move into cells unless potassium is lost in equivalent amounts. The hyponatremia is not accompanied by a parallel fall in plasma osmolality, which indicates that organic solutes have leaked from the cells into the extracellular fluid.

In most cases the disturbance is subclinical, but Hinton and her colleagues^{4, 5} correlated hyponatremia and salt retention in burned patients with the catabolic response, the diminished glucose tolerance, relative resistance to insulin, and blood volume. They postulated that the cellular uptake of sodium and water was related to disordered cellular processes involving glucose-insulin metabolism, and that this caused or induced hyponatremia, oligemia, and sodium retention. Carrying their postulate into practice, they administered repeated injections of glucose, insulin and potassium, and stopped sodium therapy. This resulted in an increased excretion of sodium and water, a rise in the plasma sodium level, a reduction in excretion of nitrogen, and elevation of a reduced blood volume, often associated with clinical improvement. The implications go beyond the field of burns and even trauma, and may have lessons for many groups of acutely ill patients, including those with myocardial infarction.

Complications of Injury

It is the complications of injury which account for the great majority of deaths and most of the illness of trauma. In this sense they are more significant than the injuries themselves. Recognition has been slow that death after injury is usually attributable to complications, and the point needs to be emphasized. The general rule is important, since processes which occur after the accident may be preventable or treatable, though time is required even for first aid measures. Time is unlikely to be available when the lethal effect, such as massive hemorrhage—though theoretically amenable to therapy—is of rapid onset. Fortunately, certain complications of slower or later onset are preventable or treatable, and some of these are worthy of mention, especially certain systemic ones which may be of interest to physicians.

Systemic complications are numerous and varied. Some, like oligemic shock from hemorrhage, cerebral fat embolism, and acute renal failure are specific types. Non-specific complications include respiratory infection, septicemia, acute pyelonephritis, pulmonary thromboembolism, and dehydration. In road accident cases, the most frequent complications responsible for death are tentorial herniation after head injury (related to cerebral

compression), severe hemorrhage, and respiratory infection. These formed a lethal triad and each contributed to or caused 20 to 25 per cent of the deaths of those injuries admitted to hospital, as established in an analysis of road traffic fatalities in Birmingham.³ Hemorrhage is still a leading complication and requires facilities for urgent, rapid, and safe blood transfusion to prevent many deaths. Nevertheless, many road accident cases bleed to death from massive injuries such as ruptures of the heart, lung, liver, and aorta before arrival at a hospital or very soon thereafter. After the lethal triad comes pulmonary embolism, pulmonary edema, pneumothorax, cerebral fat embolism and inhalation of vomitus, followed by septicemia, acute renal failure, pneumococcal meningitis, air embolism, and a variety of other complications. The similarity of many of these to those met with in uninjured patients is readily noted.

The majority of domestic accidents occur in elderly females, and their most frequent complications are related to their age group, the liability of the elderly at bed rest to bronchopneumonia and pulmonary embolism.

Among the complications of intrinsic medical interest, that of pulmonary thromboembolism, deserves further mention.

Venous Thromboembolism

Pulmonary embolism has become recognized as a common cause of illness and death in a variety of medical conditions, as well as after operation, injury, and childbirth. Thus, embolism and its underlying venous thrombosis cut across major fields of medicine, surgery, and obstetrics. Fatal emboli are often long tubular thrombi blocking the main pulmonary artery (*Figure 2*). There is no essential difference between the condition after injury and other states, and it is doubtful whether injury per se predisposes to thromboembolism. The association is indirect, related to conditions promoting venous stasis in the lower limbs. Death from embolism is sometimes quick, occurring within seconds, minutes, or hours of sudden collapse; but a variety of other syndromes occur, including gradual clinical deterioration, especially in the elderly, the acute onset of cor pulmonale with congestive cardiac failure, unexpected episodes of hypotension which might result in renal failure, acute chest pain and pneumonia-like attacks. The embolism need not be fatal; it may resolve spontaneously or lead to pulmonary hypertension and heart failure at a later date.

Unfortunately, most cases of embolism and thrombosis go unrecognized and, hence, are untreated. Though clinical thrombosis is not uncommon in patients with a fracture or other injury to the leg, and is more frequent



Figure 2. Major bifurcation pulmonary thromboembolism. Part of the thrombus lies in the right ventricle, an unusual feature.

in elderly patients with a fractured neck of femur, a variety of studies—clinicopathological, phlebographic, and radioactive limb scanning tests—have established that thrombosis after injury is symptom-free in the majority of cases (2 out of 3) and in most of the limbs (3 out of 4) even to the most watchful clinician. Thus, those with limb symptoms, like pain or swelling, are like the visible part of the iceberg. Deep vein thrombosis is silent in most patients with thrombi.

Thrombosis and embolism may occur in patients with limb fractures, head injury, chest injury, burns, and other types of trauma. The frequencies vary in the different groups, but the differences depend mainly on the duration of bed rest or other immobility and increasing age, rather than the nature of the injury. The data support the old contention that factors promoting venous stasis in the lower limbs are the major predisposing causes. Much, however, remains to be discovered about the initiating mechanisms.⁶

Silent thrombosis explains the high frequency of unheralded embolism, that is, embolism not preceded by

limb signs of thrombosis. At least half the clinical cases of embolism are associated with silent thrombosis. Further, the majority of cases of even fatal embolism, some say as many as 80 or 90 per cent, are never diagnosed. A large proportion are probably not diagnosable on specific clinical grounds, though pulmonary angiography and radioisotope lung scanning have proven to be useful tools. These facts have a considerable bearing on the question of treatment vis-à-vis prophylaxis. Even if every case of potentially diagnosable thrombosis or embolism was effectively treated by anticoagulants or lytic therapy, the majority of cases would remain undiagnosed and, hence, untreated. Consequently, the policy to diagnose first and then treat, must leave aside the majority of cases. The superiority of prophylaxis over treatment depends on these considerations.

About 15 years ago,⁷ a controlled clinicopathological trial of oral anticoagulant prophylaxis was carried out among elderly patients with fractures of the hip. We established that oral anticoagulant prophylaxis did prevent thrombosis and embolism; that it was safe, effective and practical, provided that therapy was carefully controlled by appropriate laboratory tests, and that those with particular contraindications were excluded. This trial laid the basis of the present prophylactic program at the Birmingham Accident Hospital, against the development of venous thromboembolism. Oral anticoagulants are the sheet-anchor of this regime.

The policy is primarily directed to high-risk cases, that is, patients over 40 years of age, who are admitted and likely to be at bed rest for more than three days with certain injuries, especially fractures of the lower limbs. Therapy is begun on the day of admission if possible, and is continued under laboratory control until the patient achieves reasonable independent mobility. This program has been in operation for over 14 years in our hospital. It has reduced the frequency of fatal embolism by 80 to 90 per cent, and between 20 and 30 lives are thereby saved every year. Consequently, a significant advance in the care of the injured has been the introduction of a medical prophylaxis against thromboembolism.

Physician's Role in Trauma

As a pathologist, it would be presumptuous for me to detail the when and how of a physician's role; and I ask your indulgence in my attempt to delineate his potential in the realm of trauma. In doing so, I will first outline the aspects to which his contribution would seem particularly relevant.

Broadly speaking, the potential role of the physician in the care of the injured is based on four tenets:

1. The medical problems and complications which arise during the course of the posttraumatic illness and in convalescence;
2. The preexisting medical condition of the injured patient, especially the presence of diabetes mellitus, various anemias, hypertension, coronary disease, stroke, chronic bronchitis and emphysema, and malignancy;
3. The growing problem of iatrogenic illness;
4. Advances in the understanding of certain post-traumatic events and their therapy.

For convenience, the medical problems may be divided into those affecting different systems and functions of the body, that is the cardiovascular system, respiratory tract, nervous system, and so on.

The list given in *Table I* is not exhaustive; a few have already been considered, and brief comments on several others are not out of place.

Traumatic Shock and Heart Failure

Shock after injury is largely oligemic in origin, but sometimes the question of central cardiac failure arises and this may have an important influence in management. A mixed picture of oligemic shock and central failure may be difficult to unravel. It poses problems in accurate diagnosis, and for infusion therapy vis-à-vis overloading the circulation; and questions arise concerning possible benefits of digitalis, anti-adrenergic vasodilating drugs, and other medical therapy. Cardiologists would have much to contribute in this field.

Arterial Thrombosis

This is an unusual phenomenon in the absence of direct arterial injury. However, unequivocal posttraumatic cases involving large or important arteries have been reported, including cases of coronary artery thrombosis with or without frank myocardial infarction.⁸ Some of the patients were children or young adults with minimal atherosomatous disease, so that causes other than arterial disease were operative, probably posttraumatic coagulative events. Therefore, when fresh coronary thrombosis is found at necropsy in an injured adult even with atherosomatous disease, the possibility that it was precipitated by events set in motion by the accident must be seriously considered. Arterial thrombosis in such cases might be regarded as one kind of breakdown in the homeostatic balance between posttraumatic hypercoagulability, thrombosis, and fibrinolysis. Such cases require more frequent diagnosis antemortem, and intensive study.

Respiratory Problems

Their frequency in injured patients has become recognized through the advent of techniques of measuring

the PO₂ of the arterial blood readily and repeatedly. Hypoxia is not infrequent, though it is often subclinical. This is very common in patients with fractures, probably resulting from pulmonary fat embolism. Problems arise concerning oxygen uptake, disturbance of lung ventilation, and perfusion even in many without injury to the chest. The physician with respiratory interests could contribute considerably. The major respiratory challenge is, however, bronchopneumonia. Sometimes this may still be regarded as the old man's friend or the humane way out for the quadriplegic, but it still carries off too many other injured and burned patients. There is also the problem of pulmonary hyaline membrane disease and proliferative pneumonitis in patients on mechanical respirators given high concentrations of oxygen. This condition carries a bad prognosis, and oxygen toxicity is the most likely cause.

Paraplegia

A revolution has occurred in the prognosis of those

TABLE I
MEDICAL PROBLEMS AND COMPLICATIONS
OF INJURY

Cardiovascular

Central cardiac failure in traumatic shock
Arrhythmias and cardiac arrest
Venous thrombembolism
Arterial thrombosis.

Respiratory

Pulmonary dysfunction and hypoxia
Pulmonary fat embolism
Bronchopneumonia
Oxygen toxicity and hyaline-membrane disease.

Nervous

Peripheral nerve regeneration
Paraplegia and quadriplegia
Cerebral injury
Care of the comatose patient
"Lame-brains"
Cerebral fat embolism.

Renal

Pyelonephritis
Acute renal failure.

Endocrine and Metabolic

Diabetes mellitus
Pseudo-diabetes of burns
Diabetes insipidus.

Electrolytes

Hyponatremia and the "sick-cell" syndrome
Hypernatremia.

Alimentary

Acute duodenal ulceration
Paralytic ileus.

with traumatic paraplegia through improvements in their medical management. This stems back to the pioneering work of Guttman and his colleagues at Stoke-Mandeville, during World War II. The spectacular change was achieved largely by scrupulous attention to the bladder, pressure points, and physiotherapy. Nowadays, many of these patients return from the spinal units to a fruitful life within the limits of their disability.

Cerebral Trauma

In Britain, this is the most common cause of death after injury. Advancement of knowledge is important not only because of the possibility of decreasing fatality and morbidity, but also because there is great opportunity to investigate the effects of injury on brain function, to correlate the functional results with neuro-anatomical findings, and to increase knowledge about normal and abnormal cerebral mechanisms. The subject attracted the attention of distinguished neurologists like Sir Gordon Holmes, during World War I, and Ritchie Russell, during World War II, with important light being shed on normal and abnormal cerebellar function, amnesia, epilepsy, and other physiological and clinical problems. Unfortunately, interest by neurologists seems to have lessened, though some work has contributed to research on memory and learning, and even to ideas about thought and memory at the cellular and molecular level. At a more practical level, physicians have an important part to play in the care of the comatose patient, whether it is from head injury, fat embolism, or natural disease. Prolonged unconsciousness is becoming less uncommon, and such cases are a particular challenge to doctors and nurses alike with their problems of feeding, hydration, and prevention of infection *inter alia*.

Head injury has produced a growing number of cases of the so-called "lame-brains" syndrome, those surviving the trauma with serious neurological deficits or psychiatric sequelae. It has been estimated that about 1,000 of these cases occur in Britain every year, mostly as a result of road accidents.⁹ Their care and prognosis are largely medical, with new problems of rehabilitation. Unfortunately, a large proportion will never return to useful work but will require care and supervision for many years; the prognosis in others is much better. Specialized medical units to meet this growing problem are required in association with special types of rehabilitation workshops. At present, many of these patients are discharged to mental hospitals which are not geared for their care and where they commonly die within weeks of their arrival. The opportunity must also be taken to study these cases neurologically and pathologically, since this might contribute to a better understanding of the

order and disorder of the brain, including problems of dementia and epilepsy.

Other problems which require attention by physicians include posttraumatic diabetes insipidus, pseudo-diabetes mellitus in burn patients, hypernatremia after head injury, a stress ulcer of the duodenum not uncommon after extensive burning, and a number of aspects concerned with fat embolism.

Pre-Existing Disease

Many injured and burned patients, especially the middle-aged and elderly, are suffering from one or more diseases at the time of the accident. These may require therapy and may influence prognosis. A burn accident or a fall at home, or less often a road traffic accident, can be caused by a fit, faint, or collapse related to preexisting disease such as epilepsy, coronary sclerosis or hypertension, and this may have medico-legal as well as medical overtones. Clinicopathological analyses of groups of cases reaching necropsy have shown that previous organic illness contributes to death in only a small minority of road accident victims and to a minority of burn cases, but reaches higher proportions in the elderly, especially those dying after fractures of the neck of the femur, and after burns.

Medical attention may be required at the individual level for a host of conditions. Thus, patients with diabetes mellitus controlled by insulin or other means often go out of control after trauma; subclinical diabetes may become overt and even dangerous, and diabetic coma is always a hazard either through its association with ketosis or the less frequent but equally dangerous form of non-ketotic hyperglycemic coma. The onset of congestive cardiac failure after injury requires skilled medical supervision and therapy, the underlying cause usually being hypertension, coronary ischemic disease, or pulmonary embolism. It may be argued that the elderly patients with fractured hips are essentially medical cases when the initial surgical intervention is complete, requiring the care and supervision of geriatric physicians rather than surgeons. The physician is faced with a two-fold problem: retarding the advance of chronic diseases including mental deterioration, and the prevention of pneumonic and thrombo-embolic complications. Other diseases—like pernicious anemia, leukemia, and other blood diseases—may be present in injured patients. Sometimes, they are first discovered after arrival in hospital with a broken limb or other injury.

Implementation

Finally, there is the problem of implementation, how the skills of the physician can be used to best advantage

in the care of the injured, and how his efforts can be linked most effectively with those of surgeons, anaesthetists, pathologists, and others concerned with trauma. There are no ready-made answers to fall back on, except to say that modern medicine is based on teamwork, and that the practicing physician should be an important member of the medical team concerned with injured cases.

Organizationally, the hospital problems and systems of the United States and Britain differ considerably, partly because the National Health Service in Britain provides medical services free to all at the time of need, and partly because the USA is a vast country and Britain a relatively small island. Consequently, the manner of solution in the United States is likely to differ from that in Britain, and further remarks may apply only to British circumstances.

In large urban areas, trauma cases are usually segregated in special units in acute general hospitals. Intensive care units in these hospitals are often concerned with injured and other acute cases; this is appropriate ground for physicians to meet the acute problems of serious trauma. Some large units have physicians on their medical staff, such as the Central Institute of Traumatology in Budapest, where the physician engages in clinical duties and carries out research in the field of trauma. In the Birmingham Accident Hospital and other traumatic units, there is a part-time visiting physician, and his work is largely concerned with advising

in cases of medical importance referred to him by the surgeons. Periodically, geriatricians, pediatricians, neurologists, psychiatrists, and other medical specialists are called on for consultant advice. The major issue in Britain at present is the convincing of medical specialists that appointments to traumatic and burn units are worthwhile academically and professionally. It may also be necessary to impress on hospital administrators and committees the need for these appointments.

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Emergency Room Liability

JACK L. SACHS, J.D., M.D., Chicago, Illinois

IN 1971 AND 1972, 69 per cent of all hospitals in the United States had no claim against them; 10 per cent had one claim; and 21 per cent had two claims or more. Of all alleged actions against hospitals and physicians, the emergency room accounted for 12 per cent of claims; 57.2 per cent were due to surgery. Of the latter, 39 per cent were operative procedures and 35 per cent resulted from incidents in the patient's room.

The President's Commission on Malpractice was the first definitive study ever done in the United States,¹ and it produced some interesting data for all alleged claims. About 50 per cent of the claims are closed without a lawsuit, and about 75 per cent of those are closed without any payment. Of the 50 percent of the claims that are closed after a lawsuit is started, 80 per cent are closed before trial. The statistics shows that there are a little less than 1,200 malpractice trials started in a year, that is about one claim for every 120,000 patients seen. The plaintiff loses 80 per cent of the trials.

Some payment is made to the plaintiff-patient in about 41 per cent of the claims either by settlement or judgment (47% against physicians and other health care professionals; 33% against hospitals). The insurance companies state that 46 per cent of the claims were "legally meritorious in terms of liability."²

Of the payments made to claimants, about 50 per cent received less than \$3,000; 6.1 per cent exceeded \$40,000; and less than 1 out of 1,000 received over \$1,000,000, with only seven such payments per year. Women represent 58 per cent of the claimants. Although only one-third of the total population is over 40 years old, 53 per cent of all malpractice claimants are over 40, 60 per cent of these are non-wage earners (homemakers, retirees, students, etc.). No racial or ethnic groups produced a disproportionate number of claims.

Some physicians and hospitals produced more than their "fair share" of claims. More than one-half of hospital claims originated from 15 per cent of the hospitals, while 68 per cent of the hospitals had no claims in the survey year.

Knowing that 12 per cent of all claims against hos-

pitals arise in the emergency room, three questions arise:

1. Under what situation?
2. What is the present applicable law?
3. What are the therapeutic measures?

Emergency room cases in the United States fall into five general categories, as follows:

1. *Refusal to accept the patient in an emergency case, i.e. one obviously demanding immediate attention.*

The main emergency room liabilities and their prophylaxis are presented with medical-legal criteria.

The general rule of law has been that a private hospital is not under a common law duty to serve everyone who applied for treatment or permission to serve.

The Supreme Court of Delaware, in 1961, changed the rule on the basis of a case of an infant. The child was suffering from diarrhea and a temperature of 102F for four days. He was under the care of doctors and was taken to the emergency ward on a Wednesday (the doctors not being in their offices on that day). The nurse in attendance refused to admit the infant; she did not examine the child after being given the history by the parents. The court said: "We are of the opinion that liability on the part of a hospital may be predicated on the refusal of service to a patient in case of an unmistakable emergency if the patient has relied upon a well-established custom of the hospital to render aid in such a case. The hospital rule with respect to applicants already under care of a physician may be said to be under an implied recognition of this duty."³

2. *Accepting and keeping the patient for some time without service and then sending the patient somewhere else for such service.*

A gunshot case with massive bleeding is taken to the emergency room where a towel is placed around the wound; about one-half hour later a doctor comes in, finds out the victim is a veteran, and the patient is sent to the V.A. Hospital. No attempt was made to stop the bleeding. The patient was placed in an ambulance and taken to the V.A. Hospital, where he died 15 minutes after arrival.

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The court said there was liability: "A hospital rendering emergency treatment is obligated to that which is immediately and reasonably necessary for the preservation of the life, limb, or health of the patient. It should not discharge a patient in a critical condition without furnishing or procuring medical attention."⁴

In Mississippi, a 16-year-old boy was taken to the emergency room after an auto accident at 11:45 PM. He remained in the emergency room at the rear door on a stretcher, physically restrained by the ambulance attendant, intern, and nurses until 12:30 AM, when the intern instructed the ambulance driver to take the patient to a charity hospital. He died 15 minutes after getting there. Autopsy showed a ruptured liver. The victim was allegedly examined in the emergency room—he was assumed to be drunk, with no supportive measures or treatment given.

The court held the hospital liable, stating: (1) Either the doctor did not make an evaluation; or (2) He did examine the patient and in using ordinary skill and care diagnosed a critical condition, and possible internal injuries, and gave him no supportive care.

In contrast, in Alabama, a child with diphtheria was treated at the emergency room of a private hospital which had no facilities for contagious diseases. She was not accepted and returned home, where she died. Recovery was denied.⁵

3. Where a patient is taken to a hospital emergency room for emergency treatment and not for the purpose of being admitted to the hospital, is given emergency treatment and released to another hospital, the law says the hospital has fulfilled its duty.⁶

4. After a hospital emergency room accepts, treats, and then releases the patient, causing him to believe the emergency has passed when as a matter of fact it had not, or had actually deteriorated by the treatment.

A man was taken into the hospital with head pains and had to be assisted into the hospital. The resident physician examined him, took his blood pressure, ran a urine test, made a diagnosis of hypertension, prescribed sedatives. He did not take a written history. The examining doctor was relieved by another physician, who did not see or treat the patient, but who discharged him. In the afternoon, on the way back to the hospital, the patient died of a subdural hematoma. Liability for the hospital resulted.⁷

5. A hospital emergency room accepts and treats the patient and sends him elsewhere for further treatment.

In New York, an intern in the emergency room cleaned and dressed a stab wound, then sent the patient to another hospital where she died during an operation. Hospital liability was affirmed.⁸

In all of the above categories, it is the hospital's duty to provide emergency services. Violation of the duty causally resulting in damages equals liability. Violation of a state statute making it mandatory for all hospitals, public or private, to provide emergency medical care will make the hospital liable. The receipt of Hill-Burton funds directly or indirectly may pave the way for a lawsuit, based upon the failure to observe the 5th and 14th Amendments.

If the hospital is accredited, it is subject to the regulations and standards of the Joint Commission for Accreditation of Hospitals. Proof of violation of such standards and regulations could make the hospital liable.⁹

The conditions of participation of HEW and your state licensure regulations must all be carefully observed.

Now that we have the five basic categories of emergency room cases wherein liability falls, specifically what are the emergencies and what is the best way to avoid liability? The most likely emergency room situations are as follows:

- Injuries caused by extremes of temperature.
- Ingestion of poisonous substances.
- Erroneous administration of medications.
- Incidental fractures, dislocations, and sprains.
- Removal of foreign bodies.
- Postoperative embolism.
- Incised, punctured, or lacerated wounds.
- Anoxia and dyspnea.
- Cerebral accidents.
- Burns due to fire and explosions.
- Cardiac arrest.
- Syncope.
- Hemorrhage.
- Accidental falls.
- Hyperemesis.
- Conditions of shock.
- Apoplexy.
- Allergic reactions.
- Insect bites.
- Convulsive seizures.

Of the above, there are a number of situations that should demand the immediate attention of a physician: They are, as listed by Flint:¹⁰

1. Massive hemorrhage from major vessels.
2. Cardiac arrest.
3. Cessation or acute embarrassment of respiration.
4. Profound shock from any cause.
5. Rapidly acting poison.
6. Anaphylactic reactions.
7. Acute epidural hemorrhage.
8. Acute overwhelming bacteremia and toxemia.
9. Severe head injuries with rapidly degenerating vital signs.

10. Penetrating wound of the pleura or pericardium.
11. Rupture of an abdominal viscus.
12. Acute maniacal states.

The question then arises, who is to make the decision in a doubtful situation? *Never* should it be made by a clerk, aide, orderly or even a nurse: *only* by a physician. Be sure that nurses and interns are able to spot the doubtful cases and always call a physician in for diagnosis.

A majority of the emergency room cases have involved a medical decision attempted by an intern or nurse, or their failure to recognize serious symptomatology.

The hospital owes every emergency patient a duty to act reasonably in treating him, and to hospitalize the patient if medically indicated. Do not discharge the patient against his will; that is abandonment, and liability could follow. Do not allow patients to leave who are unable to take care of themselves—such as children, old people, or the disabled—except in the care of relatives or friends, or social welfare governmental agencies. If the physician in charge of the emergency room is satisfied that the patient will be given adequate care-protection, then the patient may be released; not otherwise, even to the police.

There is an absolute right of release to adult of sound mind. Record the insistence on leaving and have a release signed and witnessed by a friend, or a member of the family, if possible.

Do not release patients with a contagious disease, those of not sound mind, or who could be a threat to others, unless after emergency treatment the hospital does not have adequate facilities for continued care. Then it is your duty to transfer the patient to another hospital that can treat the patient.

Where there is an unmistakable emergency, and the hospital denies emergency treatment based on inability to pay, liability will follow.

Does the hospital have written policies concerning the extent of treatment in the emergency room service approved by the medical staff and the hospital management, and kept updated? Failure to have a written policy or violation of one could make the hospital liable. Kansas statutes provide that a written emergency room procedure should be provided and approved by the medical staff.¹¹ Medicare requires that there be written policies which are enforced to control emergency room procedures.

Does the hospital live up to your state statute that there be adequate space and facilities to assure the health and safety of all patients? The hospital emergency department must live up to the standards set by JCAH,

HEW—Medicare, and the state statutes. Failure to meet the standards could lead to liability.

HEW, JCAH, and your state regulations require that the emergency room keep a concise, detailed medical record. The Kansas statute provides that the record must include:¹²

1. Patient identification.
2. History of disease or injury.
3. Physical finding.
4. Laboratory and x-ray reports, if any.
5. Diagnosis.
6. Record of treatment.
7. Disposition of case.
8. Signature of physician.

The emergency room records must be kept for as long a time as provided by law, or as by your statute of limitations. A minor's record should be kept until after he or she reaches majority or is emancipated (the statute of limitations does not start to run until he or she comes of age or is emancipated).

The statute of limitations simply means that the injured person has a limited time set by statute from the date of the injury to file a lawsuit. The Kansas statute on limitations provides as follows:

1. Battery—one year.
2. Tort (malpractice) and death—two years except when the act giving rise to the cause of action first causes substantial injury.
3. If the fact of injury is not reasonably ascertainable, then the statute does not start until the fact of injury becomes reasonably ascertainable to the injured party, but no longer than 10 years of the negligent act (ionizing radiation injury).
4. The statute of limitations does not apply to minors until they reach 18 years, to an incapacitated person, or one in prison. After the disability is removed, they have one year in which to file, but in no event after 22 years from the date of the accrual of the accident. If the party dies under their above disability, then there is one year in which to file after the death. In Kansas, the infancy disability is not affected by marriage.¹³

Emergency room medical records should be reviewed and evaluated on a regular basis. A daily chart check is advised, with emphasis on severe trauma cases. This should be coordinated with conferences with specialists to highlight the deficiencies, if any. Remember, good medical records are the best defense against malpractice.

Disclosure of Information

Disclosure of information considered privileged could give rise to a lawsuit for libel or slander; for betrayal of professional secrets, especially where the statutes have

created that duty; for invasion of privacy causing harm; ridicule; or humiliation.

At common law there is no physician-patient privilege: it is created by statute. The privilege belongs to the patient, not to the physician, and only the patient can waive it, except in the following:

1. Criminal proceedings.
2. Mental competency.
3. Workman's Compensation.
4. When the patient is a party litigant for personal injury.
5. Statutory reportable information such as VD and communicable diseases, child abuse, police cases, etc.
6. Qualified privilege, such as insurance companies whose policies have a consent.
7. The news media only as to patient name; the general condition of patient, i.e., "serious," "fair," "good," the time of death or birth.

Do not give the name of the attending physician without his consent. Do not give a detailed medical diagnosis without the prior written consent of the patient (or a responsible relative, verified by the attending physician). Do not allow photographs or interviews without the patient's written consent. Do not discuss the cause or motivation of an injury.

A case comes to mind where there was no written consent to divulge information. In Savannah, Georgia, the hospital and reporter were held liable for publicity about a stillborn deformed child. You may recall the story and picture in *Time* magazine about a fat woman and how prodigiously she ate. There was a \$40,000 award.¹⁴

The hospital procedure manual should state that no information shall be released to the news media or anyone else concerning patient care or other emergency room functions, except by authorized individuals after approval by the hospital administrator or his authorized representative. Remember, the free press is subservient to the private rights of the patient. With regard to the record, make certain that:

1. An adequate record is kept as to symptoms and medications;
2. The record is read. Sometimes, a wet x-ray is read and the patient is told there are no fractures, and is sent home. The next day, the radiologist receives the dry films and records his findings of a fracture in the record. No one reviews the record and no one notifies the patient.¹⁵

Patient's Consent

Emergency room care requires the patient's consent—his or her informed consent. The patient must be told of:

1. The medical risks involved;
2. Probable duration of incapacitation;
3. The alternative medical procedures for care or treatment.

The patient must be told of the above not in medical language, but in words he or she understands, so that the consent given is an informed one. The consent is needed, otherwise a battery is committed and liability follows (a battery is the intentional touching of another person without their consent). A mentally competent adult has the right to refuse treatment, and one must honor that refusal. If one has treated the patient and he or she says later that treatment was not authorized, the signed consent form, if proven, will relieve the physician from liability.

The exception to the above risk is where an actual emergency exists. What is an emergency? A true emergency is one where there is an immediate threat to life or health, or the patient is incapable of making an intelligent, conscious, and knowledgeable decision.

A true emergency room as such does not exist any more. Physicians see their patients as outpatients in the emergency room more and more, as house calls and night calls have faded away. The hospital emergency room has become the most readily accessible place to receive medical care. Therefore, one must differentiate between emergency consent (where true emergency exists, as defined above) and implied consent.

Implied consent may be inferred where the patient's work or actions lead logically to the conclusion that the patient has consented to the procedure (i.e., going to a physician's office for examination or treatment—a consent implied in fact). A true emergency situation is consent implied by law.

Record the emergency by proper consultation before any procedure is attempted. The magnitude, immediacy, and the nature of the threat to life or health should be recorded. When a hospital asserts an "emergency" as a defense for a non-consensual procedure, the burden of proof is on the hospital to show that:

1. It was impossible to obtain the patient's consent;
2. Someone legally authorized to consent was not available;
3. Any delay would increase the hazards to the patient;
4. Reasonable attempts were made to get the consent, specifically for minors.

All of the above should be recorded.

Allied Medical Professionals

The growth of medical technology, technique, and electronic instrumentation employed in emergency rooms,

plus the doctor shortage, has resulted in the greater use of paramedics. This has added responsibility for the hospital emergency room. Liability follows under the theory of *respondeat superior* (the superior is liable for the wrong). With the new devices and techniques, new mechanical and electronic instruments are used by the paramedics, so liability may follow under the doctrine of *Res Ipsa Loquitur* (the thing speaks for itself). The three following elements are significant:

1. Sole and exclusive control by the doctor or paramedic,
2. The patient did not contribute to the injury,
3. It would not have happened except as a result of negligence, i.e., x-ray burns, electrocution, etc.

Those who are concerned with the legal liability in the emergency room should be aware of the new role for physician's assistants, nurses, nurse's assistants, and technicians. Keep up with the statutory changes, federal, state and local standards, accreditation requirement, hospital bylaws, rules and regulations, all of which do influence the courts.

Crosby¹⁷ stated it most succinctly: "For the physician, the major legal risks . . . are lack of documentation, inadequate work-up, premature dismissal, liability for the acts of others, and giving treatment outside his field of competence, instead of attending only to the immediate need and then calling in the proper specialists."

Summary

Prevention is the best defense against malpractice. Listed below are what I call malpractice prophylaxis, "Commandments":

1. The physician or hospital should care for every patient with scrupulous attention to the requirements of good medical practice.
2. The physician or hospital must know their legal duty to the patient.
3. The physician or hospital should keep "ideal" medical records in every case, records that would be presentable when offered in court; records that clearly show what was done and when it was done; records that clearly indicate that nothing was neglected and that the care given met fully the standard demanded by the law. If any patient discontinues treatment before he should, or fails to follow instructions, the record should show it; a good method is to file a carbon copy of the letter which advises the patient against the unwise course.
4. The physician or hospital should exercise tact as well as professional ability in handling the patient. A proper professional manner and a sound attitude should be maintained at all times toward both the patient and

the patient's family. The attentive physician may early sense some unsatisfactory and disturbing undercurrent which, by the institution of protective measures, may be prevented from developing into something much more unpleasant. Thus, if the patient is not doing well, consultation may be suggested; if the patient is dissatisfied or complaining, or if the family's attitude indicates dissatisfaction, consultation should be demanded. The use of a consultant affords, in any case, great protection against a malpractice claim.

5. The physician or hospital should refrain from overoptimistic prognoses and should avoid promising too much to the patient.
6. The physician should advise his patients of any intended absence from practice and should recommend, or make available, a qualified substitute.
7. The physician or hospital should unfailingly secure written informed consent for all procedures and for autopsy.
8. The physician should carefully supervise assistants and employees and take great care in the delegation of duties to them.
9. The physician should have some knowledge of the statute of limitations and of its significance.
10. In his selection of patients, the physician should limit himself to such fields as are well within his qualifications. He should keep abreast of progress in the medical profession.
11. The physician should keep inviolate all confidential communications.
12. The physician should frequently check the condition of his equipment and make use of every available safety installation.
13. In the treatment of the patient, the physician must not experiment.
14. The physician must be careful to render sufficient care to his patient in general instructions, frequency of visits, clinical and roentgen ray laboratory investigations, and the like. Moreover, every precaution should be instituted for the protection of those caring for the patient and of all other contacts.
15. The patient must not be abandoned. The physician-patient relationship can be terminated without liability only in certain ways and under certain conditions.
16. Except in actual emergency, the physician should not examine a female patient unless a third person is present. There is no more serious or destructive charge than that of undue familiarity; and the only way to avoid claims of this sort seems to be to have someone else present during all examinations.
17. A physician or hospital administrator should seek consultation whenever it appears that the quality of medical care may be enhanced thereby.

18. *Doctrine of Informed Consent.* The physician is under a duty to make a reasonable disclosure to the patient of the nature and probable consequences of the suggested or recommended treatment, and he is obliged to make a reasonable disclosure of the dangers within his knowledge which are incident to or possible in the proposed treatment.

19. In doubtful situations in the emergency room, only a physician should make the decision. Under no circumstances should it be made by an orderly, aide, clerk, or nurse.

20. It is advisable that emergency room nurses and interns be able to spot the doubtful cases and always refer them to a physician for diagnosis.

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Fatal Trauma

Medical-Legal Aspects

WILLIAM G. ECKERT, M.D., Wichita

A FRUSTRATING PARADOX exists today in the United States and in other countries in that many of the classical medical-legal problems common in private practice are not fully presented to the student physician or attorney during his training. Medical and legal investigation of fatal trauma is a case in point. A study of this problem must have as its given objectives the establishment of the cause, recognition of its effect, and application of this knowledge to the medical and legal management of the case.

Trauma may be caused by physical, thermal, electric, or chemical means, or by combinations of these forces.

The effect of trauma in general is dependent on the magnitude of the force, the time of exposure to these forces, and the vulnerability of specific anatomical structures of the body to these forces.

Complications of trauma include embolization, delayed hemorrhage, infection, paralysis and visceral injury including infarction, rupture or failure, and finally death. Embolism is frequently seen and may arise from marrow, injured veins in traumatized extremities, or fragments of viscera including liver, brain, skin, and occasionally bile salts. Air embolization may be a factor in cases of massive injury to the extremities, neck or chest, where there is exposure of vascular channels. Blood clots in the pulmonary arteries are the result of embolization due to poor circulation or delayed mobilization of a convalescing injured patient. A paradoxical embolus may occur from the right side or venous circulation and enter the left side through the patent foramen ovale and result in peripheral embolization. Injury to blood vessels within the path of a bullet may result in delayed hemorrhage.

Investigation of the Accident

The study of the effect of trauma must include examination of the entire case. Thus, all the steps in handling an injured person must be scrutinized from the initial handling at the scene, transportation to the

Associate Director of Laboratories, St. Francis Hospital, Wichita.

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hospital, emergency room care, operating room management, postoperative care, convalescence and, finally, the determination of disability. The problems of concomitant natural disease must be considered, and those complications which arise as a result of misdiagnosis or mismanagement must also be evaluated. A final consideration must be given to those cases where the dam-

A practical guide on the investigation of fatal trauma for coroners is presented.

age is disabling and the period of recovery continues over many months and years with no definite return to normal. Disability must be evaluated in all these cases to provide the patient proper recompense for suffering and damages.

From the legal standpoint, the medical-legal investigation must determine the basis of the trauma, whether it is self-inflicted, accidental or homicidal, along with the chances for survival, the effects on mobility after the injury, and the role of intoxicants. For example, in cases where the injury potential may be minimal and yet the victim has received massive injury, there is a suggestion of a premeditated murder. Meanwhile, when little or no bleeding or characteristic injury is found in the case exposed to high degree of potential injury, there is a suggestion the death was a complication of a natural disease process, such as heart disease. In addition, we must determine the contribution of intoxicants to the cause of death. The time of death, especially in accidents involving deaths of husband and wife, when it must be established which party had pre-deceased the other, may be crucial. The mobility after the lethal injury is also an important part of the medical-legal investigation.

The two main types of physical trauma usually are the penetrating and non-penetrating injuries. Penetrating injuries include those where there has been penetration of the body by a flying object or by a sharp object or instrument. Non-penetrating injuries include those in which a body area has been exposed to blunt force which may be localized or generalized. A special type of non-penetrating injury is traumatic asphyxia, due

to the compression of the chest by heavy weight or a large volume of dirt.

Investigation of Death

The objectives in investigating traumatic deaths are: (1) to determine the cause of death; (2) to determine the effect of trauma as applied to similar cases. Thus, demonstration of the cause and effect is a prime concern of the forensic investigator.

Trauma itself must be studied by considering its various components, including the direction, character, magnitude, duration, and frequency of the forces. The time of exposure to these forces, the vulnerability of a specific anatomic structure to injury, and the secondary effects of a trauma must also be considered. In this regard, secondary missiles may result when a bullet strikes the bone: fragments act as secondary missiles, thus increasing the effect produced by a single missile. Delayed effects of trauma should also be considered. In the case of a gunshot wound to the head or the spine, death may be delayed up to two years after the original injury, but despite the lag, it is still important that these cases be properly investigated.

Determination of the manner of death is vital to the medical-legal investigation of a case. There are cases of apparent accidental or suicidal basis which are in reality masqueraded homicide undetected by the law enforcement authorities.

The determination of potential activity of the victim is extremely important, so that the police have knowledge of how much activity an individual could have with a lethal injury before collapse and death. Apropos to this, an individual stabbed or shot in the heart may be capable of climbing several flights of stairs before he collapses and he may thus be some distance from the place in which the injury was sustained.

The role of the natural death or the natural disease processes must be evaluated in every case. In the drowning of an epileptic, one must consider the possibility of a convulsion occurring under water. In one instance, a woman attacked a policeman with a knife. He shot and killed her in self-defense. She was found to have a tumor of the brain, which could explain her instability and bizarre behavior.

The forensic expert looks at a wound differently than the surgeon or the physician in charge. The forensic inspection and documentation of the wound includes recording dimensions, depth of penetration, angle, and location of the body in relation to the assailant. This is necessary to give the police and law enforcement officials information as to the type of weapon or weapons they should be searching for. Defense wounds occur



Figure 1. Homicide by stabbing with a steak knife in the neck. A secondary injury due to the impact of the knife handle is noted along the lower jaw.

where a victim attempts to ward off blows or attempts to grab the weapon of an assailant. The injury may be seen on the fingers, hands or forearms, but should be distinguished from secondary injuries from knife handles or guards (*Figure 1*).

The proximity of the gun may be indicated by the presence of a smudge or powder stippling about the



Figure 2. Contact wound of gun with the skin in the right temple. Note black powder smudge about the bullet entrance wound and the stippling of the adjacent skin with unburnt powder particles.

entrance (*Figure 2*). In the case of a shotgun wound, the tight pattern of the shot indicates close proximity (*Figure 3*). Bullets upon entering the body may undergo great change. The bullet going through bone will flatten or fragment, while the bullet going through soft tissue will show little change. A bullet remaining in the body for a long time will have calcium deposited on it. The medical-legal investigator may also be able to help the police with suggestions on the type of assailant by the injury patterns on the victim. An overkill situation (*Figure 4*) is commonly seen in homosexual murders. In professional killers a shot in the back of the head is seen quite frequently.

Unusual injuries may also be seen where the body may be penetrated by air, paint, grease, and sand from a high-pressure source. A jab with a high pressure hose, 1,500 pounds per square inch, may cause a deep penetration and severe disability and if a hollow viscus is rapidly inflated, as with air, it will rupture the viscus.

Trauma in drug addicts is commonly related to intravenous injection of drugs. These may be injected into an artery leading to severe damage to the circulation and possible amputation may result. Systemic embolization of minute impurities, including talc and cotton, may cause damage to the lungs, kidneys, and other viscera.

In child abuse, there is a variation of the age of injury with areas of ecchymoses, teeth marks, or fractures in different stages of healing. Thus, the presence of repeated injury in a child with a variation in healing and age of the injuries should make one suspect the battered child syndrome. Bone healing and periosteal calcification seen on x-ray will have confirmative value.

Elderly people in nursing homes may present problems of unexpected trauma. They may develop a stroke-like syndrome and be treated accordingly, while at autopsy a subdural hematoma may be found. Investigation often fails to reveal evidence of trauma.

Vehicular Accidents

Traffic accidents provide an excellent model for study of trauma. Before autopsy, the victim should be identified to the medical-legal investigator. The body should be examined for external signs of trauma and for internal injuries. The findings should be evaluated for patterns which may indicate the position of the individual in the car.

Unsuspected injury is one of the major problems that may occur in an unconscious patient. Thus, death due to unsuspected rupture of a viscus or a blow-out of a subcapsular hemorrhage of the spleen or liver may be associated with head injury, and it may cause a major problem of differential diagnosis. Evaluation of cause

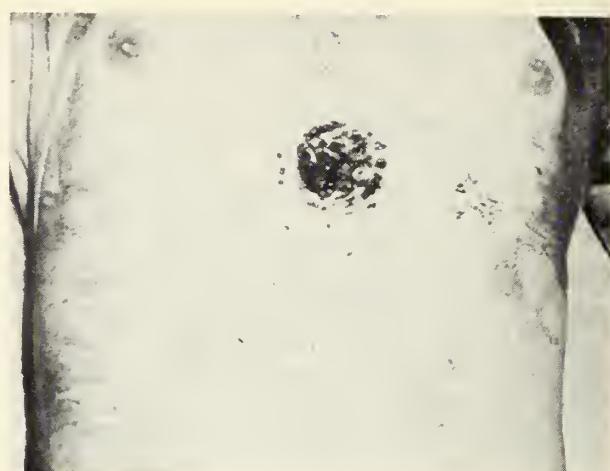


Figure 3. Close wounding with a shotgun in a suicide. Note tight pattern of the shot.

and manner of death is extremely important to establish whether there were any failures or mishandling in the management of the case. The presence of a natural disease process must also be brought into the picture, as well as the role of intoxicants. Cases are now being seen where young people under the influence of drugs walk into the street deliberately trying to get hit.

The physical forces to which the body is exposed are enormous. A car going 50 miles an hour which strikes a fixed object may stop in less than one foot's distance. The car itself may be exposed up to 170 Gs, and the victim in the car without seatbelts will be rattled like a rock in a box, giving many opportunities for him to be exposed to fatal injury. The shoe of a victim must be examined for the presence of an imprint or a stamp of



Figure 4. Multiple homicidal stabbings in the typical overkill fashion of a homosexual murder case.

the brake pedal on to the shoe, indicating the shoe was in contact with the brake pedal at the time of the actual impact.

The clothes may be examined for stains of oil or marks of a tire. If the body has been run over by a tire, injury may be manifest by markings of the tread and be indicative of the width of the tire. In one case, a truckdriver crawled under a truck which had trouble with a gear. The truck rolled over him; he crawled away, walked about 150 yards, and collapsed. The tread width and type matched those on his body.

Traumatic asphyxia is another serious injury in accidents where the victim is pinned by a tractor or car without roll bars. It is characterized by cyanosis in the upper extremities and the face, bulging of the eyes, and petechiae of the skin and conjunctivae. Other complications in crashes include exposure to gasoline, which may result in a toxic nephrosis leading to lower nephron nephrosis, and electrocution where a light pole may support wires which fall when it snaps and the victim may step on it. There may be little evidence of electrocution, with little evidence externally, except singeing of hair or charring of a small area of skin.

Bizarre cases may be seen where the body is exposed to severe trauma, such as the one in which the body of the individual was pinned underneath the car wheel and the wheel was oriented along the longitudinal axis of his leg. The wheel was spinning at a very high rate of speed. The rubber melted and was forced into the femoral vein, thereby into the heart, where it caused a rupture of the right ventricle.

One of the problems that occurs in auto crashes relates to fire. The main concern is to make sure that it was not a masquerade, where the individual was killed, put into the car, and set afire.

In a fire victim, the teeth may be valuable points of identification. The light-red color of the tissue represents carboxyhemoglobin perfusion, which demonstrates that the person was breathing in an environment rich in carbon monoxide. Carbonaceous material in the larynx may also indicate viability during a fire. One must be aware of the artifacts that occur in a fire, such as heat fractures of the bones and collection of blood in the extradural space.

In aircraft accidents, one needs to ascertain whether or not the individual had control of the plane. If the individual had his hands on the controls, there will be fracture dislocations of the fingers as evidence of trauma forces transmitted to him on impact through the stick.

Summary

To study a trauma victim, one must: (1) document the external and internal injuries; and (2) relate the injuries to the scene of the accident and to the nature of the forces to which the victim was exposed during this period. Such knowledge should be used for the purpose of influencing the clinical management of the given case, as well as similar cases in the future. This knowledge can be used to predict injury patterns which are shown to exist in specific accident situations.

AMA CONTINUING EDUCATION PROGRAM

The American Medical Association's new program of regional continuing education for physicians will be launched next year with meetings in Florida, Arizona, Minnesota and Virginia.

The purpose of the program which will be conducted by the AMA's Council on Scientific Assembly, is to take AMA continuing education courses to physicians throughout the country. The regional programs are an outgrowth of the successful continuing education courses presented at the recent AMA annual and clinical conventions.

The courses will be held on weekends to enable physicians in each region to attend at the lowest possible cost in time and travel expenses. Active support from state medical associations will be sought in each region.

Each regional program in 1975 will include eight courses, with faculty drawn largely from nearby medical schools. All courses will qualify for the highest category of continuing education credit. The courses are: Dermatology for Non-Dermatologists; Infectious Diseases and Antibiotics; Basic and Advanced Life Support-Cardiopulmonary Resuscitation; Fluid and Electrolyte Balance; Venereal Disease; Pulmonary Function and Blood Gases; Basic Electrocardiography, and Human Sexuality.

Seven of the courses will be of six hours duration and will be presented twice on each program, enabling doctors to take two courses. The session on cardiopulmonary resuscitation (reviving heart attack victims) is a 12-hour course.

Schedule of the regional courses will be as follows: Tampa, Florida, February 8-9; Phoenix, Arizona, March 15-16; Minneapolis, Minnesota, July 26-27; Williamsburg, Virginia, September 27-28.

Further information on the courses is available from the Department of Scientific Assembly, American Medical Association, 535 N. Dearborn St., Chicago, Ill. 60610.

The President's Message

MERRY CHRISTMAS AND A HAPPY NEW YEAR!

Christmas is a time to remember, a time to rejoice, a time to reassess our priorities, count our blessings and, the real meaning of it all, to celebrate the birth of the Christ child. In addition, for me, the past two years which I have spent serving on the Admissions Committee at the KUMC, have been cause for added reflection.

The world events today have increased in momentum so that time, things, places, friends, and events happen so fast and are of such short duration that they become almost meaningless. We as a nation, in failing to reflect, are becoming a people without memory.

Twenty-three years ago, our daughter, seven years of age at that holiday season, was involved in an automobile accident, receiving a compound comminuted fracture to the skull penetrating into the left-frontal lobe. I, shortly before this accident, received a comminuted fracture of the left leg. On crutches and with one leg in the cast, and with an apparently dying daughter, I rode the ambulance with her to KUMC. Dr. Bill Williamson had alerted surgery and was waiting for our arrival. A guardian angel rode that ambulance that day, and Donna was alive and not shocky on arrival. Near midnight, Dr. Williamson comforted two distraught parents and assured us that everything would be alright. Prayers of thanksgiving for such doctors as Dr. Williamson and Dr. Brackett, and such institutions as KUMC, were offered with all humility and dignity only two grateful and hopeful parents facing a most trying situation can offer.

Some two or three years later, with our daughter adapting magnificently to partial loss of motor function to one-half of her body, it was our turn to do something for the Williamsons.

On Christmas morning, 2:00 AM, all through our house, every creature was stirring and on the pickup truck was Kate, a black Shetland pony, saddled and bridled; and two children, Donald and Donna, ages 10 and 13, and a happy father—on our way to West 79th Street, Kansas City, Missouri, to surprise the Williamsons on Christmas morning. And surprise them we did, finding them in bed. Kate lived with the Williamson family in round numbers, ten years. All five children learned to ride with her and developed a warm and happy human relationship that they recall with pleasure yet to this day.

A great moment in my life came in interviewing freshman students for the Medical School class of 1973. Young John Adrian Williamson was interviewed by my team and not until the interview was finished did we reveal our relationship (previous to the interview, I had declared a conflict of interest). Young John Adrian Williamson is now in the sophomore class. Eventually, the five Williamson children outgrew Kate and the whole family (all seven) brought Kate back to the farm—a memorable day for both families.

The editor of the *Hutchinson News* by now had a growing family of some seven children. The following Christmas Kate was given to the McCormally children, where she again became the greatest pony of all, as recalled now by young adults.

Old Kate always had a very special place in our family—having been sold to Donald three years before going to the Williamson family. This took place in the auction ring at Perry, Oklahoma, by Perry Carlisle. Donald was bidding on the pony without our knowledge, and Perry selling it to him knowing we were not aware of his bidding. Imagine our surprise when "Sold to Donald Blank" came over the PA system, and later, of course, Kate being the children's choice to give to the Williamson children.

We have raised ponies and horses now over a quarter of a century. Many were sold for high prices, however, the ones that have always given us the most satisfaction were the ponies sold to children so that their meager budget or allowance would buy a pony. Many were given outright and likewise many have been brought back to the farm as children outgrew them.

Writing this President's Page recalls literally dozens or even hundreds of episodes and hours that have created lasting and meaningful ties between peoples, these ties always providing significance and depth of meaning to our daily lives.

Being the President of the Kansas Medical Society has many pleasures for me and my family, one of these being the opportunity to know so many wonderful and dedicated people. Living up to your expectations is a challenge which we readily accept, and dedicate our energies to that end, always mindful that in being your first family in a moment our lives are gone.

Our sincere wishes to each of you for a Merry Christmas. *John, Mildred Blank and Family*



Editorial COMMENT

A Case of Consumption

The secularization of the ancient and holy rites of healing has been demonstrated in recent times by certain lexicologic changes which have produced in the latter day priests reactions varying from puzzlement to dismay. We recall feeling the former some years ago, when confronted with the necessary quintuplicated form for payment of service to a ward of the state to find that we were classified as a "vendor." The term seems to suggest the mechanized issuance of a packaged item or service in response to (and in proportion to) a measured sum of money introduced into the machine. A little reflection brings the inescapable feeling that there is increasing substance to this interpretation. Even the physician, trying to endow his service with some consistent and measurable concept, has resorted to classifying it in "units."

Comes now the outcry from the masses (or certain self-appointed spokesmen thereof) that virtually all providers of goods and services are guilty of deficiencies in the quality and quantity of those things they provide. This is no new concept. We recall the flap caused a good many years ago by the book, "100 Million Guinea Pigs," which exposed in lurid anecdotes the dangers confronting the unsuspecting citizenry from all manner of household items. These earlier efforts, however, never commanded the attention the instant experts of today have achieved. Perhaps this is because there are now more than twice as many guinea pigs, but more likely it is because we all, in one way or another, can be included in that currently popular designation, "consumer." And now, even the physician is confronted with the proposition that that person across the desk is no longer a patient (certainly no longer patient) but a consumer.

This new designation poses to the physician the uneasy thought that he is the thing to be consumed, and support for such fears can be read into numerous instances of current change. Even if he manages to retain the objective understanding that it is his service that is under consideration, he is forced to an inevitable though not necessarily undesirable reexamination of his function as it fits into the current socioeconomic scheme. He has performed with the conviction that he is the final and

unassailable authority in the interpretation of his patients' needs as well as the direction and manner of their relief. The thought that the patient should be at least an equal partner in the venture is not entirely strange. He has long recognized that the patient's understanding and cooperation in the venture are of prime importance in the success of the treatment. But the complexities of current diagnostic and therapeutic regimens combined with the pressures of time and volume have often resulted in an attitude of rejection of anything he interprets as interference. This comes through as an inflexibility or a patronizing approach which the patient-consumer and his advocates increasingly interpret as manifestations of physician self-interest. While a strong case can be made that the traditional physician-patient relationship is still viable, it should be recognized that a considerable volume of medical care is not productive of such a relationship or dependent to any great degree upon its presence for successful therapy. The patient-consumer is frequently more interested in getting prompt relief and going on his way, just as he is more interested in getting his ready-to-consume food off the supermarket shelf and navigating the check-out line as quickly (and cheaply) as possible, than he is in developing a personal and mutually rewarding relationship with the now almost nonexistent neighborhood grocer. The physician faces the paradoxical demand that he give complete and personalized attention but with the speed, variety, economy, and efficiency that characterizes the supermarket function.

He is frequently (and correctly) advised that a large factor in his malpractice woes is the depersonalized and dehumanized form of current medical practice. The recipient of his services feels himself treated more as a consumer than a patient, and the defendant in malpractice actions is more apt to be a physician of impeccable qualification who has failed to establish an adequate degree of personal relationship with the patient-consumer than the incompetent bungler who manages a strong emotional hold on the individual. The physician has always known that a certain number of bad results were

inevitable and felt that they should be excused. Now the trend is toward convincing the physician that he should accept the obligation to compensate the sufferer for these bad results and that his salvation, therefore, lies in a system of automatic remuneration to the plaintiff without (in theory, at least) critical comment on the defendant-physician. Thus doth the old order change.

But the demonstration of consumer presence and influence most certain to raise the medical hackles must surely be the idea of "directories" compiled by lay groups to give the patient-consumer guidance in locating and choosing medical service. The medical mind visualizes a sort of medical *Guide Michelin* complete with stars to denote the physician's relative professional abilities (by lay estimate, at least), comments on the specialties of the house, and the warning that, while dress is optional, reservations are a must. Having struggled to drive the hucksters out of the temple and scotch the efforts of the less qualified to make up in promotional techniques what they lack in professional status, the physician is discomfited to find that the public is seeking to gauge its choice of medical service in the same manner it would select a new car or TV set. (In a purely personal note, we are glad we forsook the gynecological examining room before it could be recorded that, whatever our professional qualifications, we would be identified as having, between the months of October and May, cold hands.) The physician's characteristic rejection of such merchandizing techniques is tempered by the feeling that perhaps he should cooperate in the hope of getting good billing.

The current trend in consumer advocacy does not appear to have crested yet and the physician should be advised that his qualifications, his methods, and his charges will undoubtedly be subjected to further questioning. He

may look upon these activities as unwarranted incursions into his professional privacy, but he will need the objectivity to recognize and separate his personal interests—which he can legitimately protect—from his patient's and assure that the latter are not restricted—not only that the patient participate in his own care but also, and more importantly, have the knowledge of the medical facts so he can make a reasonable choice. This "consumerist" attitude is probably the product of many elements, among them the increasingly complex and expensive medical techniques which have driven a technological wedge between physician and patient, insufficiency or maldistribution of medical service, inadequate communication, even simple human failings.

Whether a "directory" would serve any desirable purpose depends upon the manner of its make-up. A case can be made for the preparation of a tabulation of physicians, their qualifications, representative fees, and pertinent valid information which any physician should properly provide for an inquiring prospective patient. Some local societies have already moved in this direction, not, we are sure, without a good deal of intramural hassling. Certainly, it beats letting some lay group create its own version by default, or for that matter, reliance on the Yellow Pages. The alternative solution is, of course, an improvement in communication between physician and patient, and particularly potential patients, which means the community. This may require some readjustment in the physician's thinking as to what the public is entitled to know but if he is as capable, honorable, and virtuous as he claims, his problems would be minimal compared to trying to counter the capricious and improperly based assessments that would emanate from a lay effort without medical participation. It's a test of equanimity but worth thinking about.—D.E.G.



MOVING?

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A Matter of Membership

On November 3, 1974, the corporate body (voting body) of the Kansas Foundation for Medical Care, Inc. (KFMC) directed the Foundation to make application to become the Conditional Professional Standards Review Organization (PSRO) for the state of Kansas. This action was firmly approved, later that day, by the House of Delegates of the Kansas Medical Society.

Thus, a pivotal point in the Foundation's activities has passed. This action serves to reinforce the Foundation's conviction that physicians are the only ones who can accurately determine the quality and quantity of medical care rendered to their patients.

The Foundation's course of action now is to continue to refine the plan which we have been developing over the past five months. The Foundation's plan, we feel, is a viable one which will encompass the objectives set forth by the Board of Directors. To accomplish this within the scope of the PSRO law is a mighty task indeed.

Therefore, the Foundation needs your help. Physician involvement is a key part of our plan. Without your participation and expert counsel the Foundation plan will surely suffer.

As a member of the Foundation you can exert a direct influence on setting the standards and criteria for health care review in Kansas. You will also have a direct voice in selecting the leadership of the Foundation. While all services provided under Titles 5, 18, and 19 will be reviewed, you, as a Foundation member, can elect to serve as a reviewer, and be reimbursed for your review work.

The probable ramifications of the PSRO law are enormous. In the foreseeable future, ambulatory care review will be required. This review will be administered by the PSRO. In addition, any review programs called for in pending National Health Insurance legislation will be under the direction of the PSRO.

Two recent mailings to you have included a Foundation membership application form. If you have signed and returned it, thank you. If you have not signed up, please do so.

The Foundation needs your input in order to help guide the future of medicine in Kansas. This is your Foundation; and it, as an organization, can be no better than its membership. A wise man once said that "Good thoughts and actions can never produce bad results; bad thoughts and actions can never produce good results." The Foundation needs your good thoughts and actions—please join us.

This column will be a monthly feature of THE JOURNAL. Your comments and criticisms are welcome. *J.E.A.*

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Kansas Foundation for Medical Care

Report of Meeting Held November 3, 1974

A meeting of the corporate body of the Kansas Foundation for Medical Care, Inc. (KFMC) was held on November 3, 1974, at the Holiday Inn, Emporia. A quorum was present. Francis T. Collins, M.D., President, presided.

Doctor Collins opened the meeting with some remarks about the objectives of the Foundation. He stated that the primary objectives were threefold:

1. To represent the physicians of Kansas;
2. To operate review programs where the care is provided, that is, at the local level; and
3. To serve medicine thereby serving the patient.

Dr. Collins pointed out that the Foundation's plan for peer and utilization review has been approved by the Executive Committees of the KFMC and the Kansas Medical Society, as well as by the KFMC Board of Directors. He further pointed out that the Foundation plan has been presented to 17 of the 18 KMS Council districts, and to numerous other meetings throughout the state.

Dr. Collins then introduced KFMC Resolution No. 74-1 and the organizational chart, which were included in the delegates' packets. He stated that the resolution called for approval of the Foundation to apply to become the Conditional PSRO for Kansas. He pointed out that KFMC is the logical organization to conduct PSRO activities in Kansas. Dr. Collins also pointed out that PSRO is not an issue—it is law. The issue is whether or not KFMC should apply to become the Conditional PSRO for Kansas.

Doctor Collins then opened the meeting for discussion.

Alex Mitchell, M.D., Lawrence, after reading some statistics about physicians' fees in Kansas, spoke in favor of the resolution.

There being no further discussion, it was moved by Kenneth L. Graham, M.D., Leavenworth, and seconded by John W. Travis, M.D., Topeka, that KFMC Resolution No. 74-1 be adopted. The motion carried with two audible dissenting votes, and the resolution was adopted to read as follows:

RESOLUTION NO. 1

PSRO

WHEREAS, The Kansas Medical Society supports peer review when done locally, by local physicians; and

WHEREAS, PSRO is law and is based on locally performed peer review; and

WHEREAS, The Kansas Foundation for Medical Care

has organized a mechanism to enable Kansas physicians to provide peer review under Kansas Medical Society policy that will satisfy the PSRO requirements; and

WHEREAS, The Kansas Foundation for Medical Care has used a planning grant from HEW for the purpose of exposing this plan to all Council districts of the Kansas Medical Society and making the information available to all physicians of Kansas; therefore be it

Resolved, That this corporate body declares that the Kansas Foundation for Medical Care more adequately represents Kansas physicians for the purpose of peer review activities than any other organization in the state; and be it further

Resolved, That the corporate body requests the Kansas Foundation for Medical Care to apply to HEW to be designated the Conditional PSRO for the state of Kansas.

Doctor Collins then requested approval for submission of the previous action to KMS House of Delegates for their action. This motion was moved, seconded, and approved with two audible dissenting votes.

Doctor Collins thanked the corporate body for their action and then stated that the KFMC Executive Committee would meet in two weeks to consider future actions for the Foundation.

The chair then recognized Doctor Travis, who stated that the corporate body should acknowledge and thank Dr. Francis Collins for the efforts he has expended over the past five years in establishing and perpetuating the Foundation. This was done with enthusiastic applause.

The chair then recognized David A. Leitch, M.D., Garnett, who requested information as to the number of physicians who are members of the Foundation. Dr. Collins replied that present membership is approximately 900. He pointed out that another membership mailing would be sent out soon to the physicians of Kansas.

The chair then recognized Kermit G. Wedel, M.D., Minneapolis, who questioned the necessity of electing new representatives to the KFMC Board of Directors at this time. Dr. Collins replied that this matter will be discussed at the next Executive Committee meeting of the Foundation. Also discussed will be any necessary changes in the bylaws. These matters will then be subject to approval of the Board of Directors and, if approved, will then be sent to the members of the corporate body for their action via a mail ballot.

The chair recognized C. Thomas Hagan, M.D., Wichita, who requested information about the possibility of

(Continued on page 384)

Official Proceedings

1974 Fall Meeting of the House of Delegates

The Fall Session of the House of Delegates of the Kansas Medical Society was instituted principally to work on matters of legislative interest and for such emergency resolutions as might appear.

The resolutions presented to this House of Delegates are printed in numerical order under the minutes of the Second Session.

FIRST SESSION

The first meeting of the House of Delegates was called to order by the Speaker, Dr. Clair C. Conard, at 10:00 AM on Sunday, November 3, 1974, at the Holiday Inn, Emporia. He announced the composition of the House of Delegates for a total of 208 members, with 105 registered at this meeting. A quorum was present.

Dr. John N. Blank, President, then read the following prepared paper:

"With the election two days away, some prestigious announcements and words of wisdom are, and should be, expected from your President. I shall not fail you.

I would prefer after all the weeks and months to entitle this, my statement: "Out of Sight, Out of Mind." And if 110 of you are not tired of all this, and nobody wants to hear about such things any more, you are blanking—no pun intended—experience out of memory.

It is extraordinary how many things we don't talk about any more. There is Watergate, of which everyone is even more tired than this off-year election campaign. How many of you remember "Big John"?—again, no pun. Anybody remember "Big John"? He was that Democrat Switcheroo. He was that post-Agnew rising glory from Texas Republicanism who has now been censured, consumed, and forgotten after three minutes of fame. Three minutes of fame may be all any man, any idea, or any event can expect nowadays. No Senatorial campaign is worth \$1.5 million and possibly \$2 million of visible campaign expenses, and I predict that this is what historians will point to, that this was a major political party's in-trouble-attempt to salvage from the spoils its most visible candidate.

President Jerry Ford, on national television, said the purpose of all his campaign speeches was to insure that no candidate could say that the President would not try to help. I am sure again, another million dollars is being spent in this effort.

It is not surprising that Trivia is only one of the pastimes that have survived this past decade, for it demands only the ability to remember facts without context as we consume history with our brains turned off (a slight plagiarism here). However, it is really not important to remember who. Now, months after hundreds of campaign statements, letters to the editors—and myself, context is harder to find during this campaign than a 10- or 15-cent hamburger.

Two weeks ago, coming home from Los Angeles on the jet, after attending the House of Delegates of the AAFP, reflecting probably again out of context as I looked down on a beautiful clear day, the country did not really rush past so fast that I could not see, sense it, and digest what I was seeing. It was an extraordinary and fascinating place, but we rushed overhead so fast, the journey became almost meaningless.

The captain announced: "We are over Prescott; Albuquerque will come up shortly. About 45 degrees on the left is the Grand Canyon"—and this is all he had to say about what is rated as the number one tourist attraction in the nation, maybe the world. And further: "About 230 miles out on the horizon is Pike's Peak, and slightly to the right is Twin Buttes," all of which was clearly visible. In a few minutes, he droned on: "Amarillo," and "We are approaching Kansas over Liberal." Later, the stewardess: "The captain is starting his approach to the Wichita Airport." And lastly: "Leave your seat belts fastened until we reach the terminal at the airport."

It was a fast trip up there, 35,000 feet above context. Anything that is four minutes old is more ancient than Egypt. We appear to consume our history so fast that there is no time to reflect, and we become a people without memory.

Two days before election, and in spite of mass media, newspapers, radio, television and personal appearances, issues are still not settled or really spoken to in context. Polls show that the candidates for both governor and the Senate show 44 to 48 per cent of the voters have declared themselves voters and set in cement. This leaves 4 to 10 per cent of the votes not committed, the only sensible interpretation being that these 4 to 10 per cent of voters will settle the issues facing Kansas today. Its roughly \$2 million divided between such small percentage may mean thousands of dollars spent for this un-

committed vote (again, very likely, an individual who does not care or has shown enough interest to cast an intelligent vote).

Forecasts of what functions official state medical societies, local county medical societies, and organized local medical groups will have in the coming years vary from the pessimistic (that medical practices as we have known them are already dead of old age), to the sanguine or equally improbable idea that we will thrive and be performing and doing our same society function, modes of practice, or other activities the same as we always have.

One thing that stands out above all others, is that any government program must have strong and active participating medical agencies representing the private sector of medicine and practicing physicians to implement any or all of the many proposals facing the House and Senate today. No program, whether implemented by the state, county medical society, or the Feds will be any better or worse than the people who do the work. As I see and evaluate the main purpose facing this House of Delegates today, it is implementing the Foundation and having it designated as PSRO. The only way we can lose entirely is to default in our responsibilities in implementing a satisfactory PSRO for Kansas. Anything else will be relative.

High on the priority list must come the resolution on continuing education, which was passed tentatively by the House last spring. The interval since the last meeting was given to Warren E. Meyer to incorporate this program into the Constitution and be brought back today for final approval.

A total of some six large meetings was held involving a considerable number of people in response to the change in the Nurse Practice Act. Your medical society hosted two of the meetings. The last one held on July 25 involved about one dozen disciplines and some 50 people, after many hours of lively discussion, and with the help of a little pre-planning (and at this time I again wish to express my gratitude to our two medical educational institutions, particularly Dr. Cramer Reed and Dr. Bill Rieke).

A consensus was reached and so presented to the study committee this summer with no changes in scope of the Nurse Practice Act. Only Licensed Practical Nurses can use that title with the special favors to intermediate care homes.

Another equally important consideration for this House and for your leadership, together with Dr. Gregg Snyder, chairman of the Malpractice Committee, is to seek counsel and definite direction to your members and future activities of this all-important and timely committee.

The Leadership Conference is chaired under the able direction of Dr. John Huff, of Kansas City, who seeks your ideas and suggestions and your participation in the Leadership Conference at the Alameda Plaza Hotel, Kansas City, February 1-2, 1975.

The Joint Practice Committee has been placed under the Commission for Society Organization. The Administrative Committee to the Medical School has also been placed and structured under the Commission for Society Organization.

The Relative Value Study again rears its head above the horizon. A copy is at the printers now. This House owes this committee a rousing vote of thanks for studying this problem with tenacity and suffering all the frustrations they had to endure. Dr. Robert Purves and your committee, we thank you.

What I consider to be your most important committee—the Legislative Committee—continued to represent your Society before the legislature, giving direction to many study committees this summer. Dr. Tom Gray, you and your committee deserve a very special commendation from this House of Delegates.

In closing, the progress of the Medical Society so far this year has not been monumental. Your leadership believes that the approval of the Foundation and approval of the Foundation for PSRO within the framework of Kansas medicine will be the premier event of the year. With the Foundation and PSRO a reality, the Executive Committee can look more closely to the future, assess our programs, and set new priorities. One of the most immediate and urgent of these being, of course, to establish a functioning PSRO.

Philosophically, and in context, I believe we are well upon the way toward realization of our basic goals this year. But issues remain. The answer, I think, will be determined by the degree in which regional differences, personal consideration, and understandable prejudices are resolved in a common endeavor to reach the goal—"what is best for medicine"—unanimously sought by all.

I have always possessed the supreme confidence that the Kansas Medical Society would, as always in the past, rise to the challenges that confront it, and through reasoned and intelligent debate find solutions to which we all subscribe. I have no lack of confidence such sound solutions will be found today, setting the course for this oldest chartered organization in the state, which dates back four years before statehood. That is, until another crisis arises."

The Speaker next called upon John D. Huff, M.D., Kansas City, who announced that the Second Annual Leadership Conference will be held at the Alameda Plaza Hotel, Kansas City, on Saturday and Sunday,

February 1-2, 1975. He requested suggestions for a program and announced the committee was considering inviting physicians from other states to unite with Kansas in this conference.

The Speaker then called on H. Thomas Gray, M.D., Wichita, Chairman of the Legislative Committee. Dr. Gray reported that the legislative response to medical suggestions on naturopathy, pharmacy, nurses, and the Healing Arts Act had been favorable. He cited the danger of some federal legislation, especially in view of HR-16204 and SB-3585.

Gregg M. Snyder, M.D., Wichita, Chairman of the Malpractice Committee, next elaborated in some detail upon his committee's study on the question of malpractice protection availability.

Next, Vale Page, M.D., Plainville, Chairman of KaMPAC, presented a report.

Mr. Dwight Metzler, the newly appointed Executive Secretary for Kansas Department on Health and Environment, briefly described his agency.

SECOND SESSION

Following luncheon, the Speaker announced that the House would temporarily adjourn, and turned the meeting over to the corporate body of the Kansas Foundation for Medical Care. Francis T. Collins, M.D., Topeka, President, chaired this session, at which Resolution No. 74-1 was introduced, discussed, and adopted with only two dissenting votes. The report on this portion of the meeting appears under the report of the Kansas Foundation for Medical Care.

Following this action, the meeting of the corporate body was adjourned and Dr. Conard again called the House of Delegates to order, to consider resolutions.

The resolutions were decided in the following manner, after which the meeting was adjourned.

RESOLUTION NO. 74F-1

Postgraduate Education

Resolved, That the following changes be made in the Constitution and Bylaws:

(a) Under 1.0 Membership, the 1.1 section be altered as follows: (1) Strike the period at the end of the last sentence and add: "provided that," (and then add 1.11 between 1.1 and 1.2). This would read: "Every active member of the Society shall fulfill the requirements of postgraduate medical education set forth by the Commission for Education of the Kansas Medical Society."

Resolved, That the following postgraduate study requirements be adopted by the Kansas Medical Society as a requirement for continued membership in the Kansas Medical Society:

APPENDIX

1. Accredited education:

a. A minimum of 50 hours must be in accredited postgraduate education, such as AMA approved specialty scientific meetings, medical school sponsored programs, and AMA approved postgraduate education courses.

b. There will be no limit on credit given for this category, *i.e.*, all 150 hours could be from accredited courses.

c. Courses or institutions must be approved by the permanent Postgraduate Education Committee, appointed by the Commission for Education.

d. Credit shall be given on an hour-for-hour basis.

e. Verification of attendance by the sponsoring organization or institutions must be submitted for credit to be given in accredited education.

2. Non-accredited education:

a. Up to 100 hours may be non-accredited education, such as: (1) JOURNAL reading; (2) audio digests; (3) hospital staff meetings; (4) teaching; (5) publication of papers in recognized professional journals (10 hours each); (6) scientific meetings of state medical society, AMA, and specialty groups.

b. Credit for this category shall be approved by the permanent supervising committee (A.1.c.).

3. Certification by the American Academy of Family Practice or attainment of the AMA Physician's Recognition Award shall meet the requirements for continuing membership in the Kansas Medical Society.

B. Administration:

1. This program will be supervised by the supervisory committee (A.1.c.).

2. Records and documentation shall be maintained in the Kansas Medical Society office.

3. The program will be arranged so that approximately one-third of the Society members will come up for the three-year survey at the end of each calendar year. This process will be determined by the Commission for Education.

4. The requirement for new members will begin on January 1 of the year following admission to the Kansas Medical Society.

5. Requirements shall be on a calendar year basis.

6. Individual members shall be responsible for reporting their postgraduate education to the Kansas Medical Society office.

7. Appropriate forms shall be furnished by the Kansas Medical Society office on a yearly basis to all members to help them keep current.

8. Members not in compliance shall be notified six (6) months prior to the end of the three-year period of their delinquent status.

9. Appeals for exceptions may be made to the Kansas Medical Society Committee for Education.

10. Any member of the Society not in compliance with the above requirements by the statutory expiration date shall be notified by the Kansas Medical Society office within 30 days of his suspension for membership.

11. Any delinquent member who has been suspended may be reinstated within the following 12 months by submitting proof that he has met these requirements, provided he has submitted his annual dues. After these 12 months, the suspended member must reapply for membership in the same manner as initial application for membership.

C. Exemptions:

1. Honorary members of county medical societies.
2. Members retired from active practice.
3. Members in approved residency training programs.
4. Special exemptions may be made for long periods of illness.
5. Other special exemptions may be granted by the special committee upon application by individual members.

D. Changes in Above Format:

Since all members of the Kansas Medical Society are affected by the above requirements on postgraduate medical education, there will be no changes made in these requirements unless they have been presented to a meeting of the House of Delegates and approved.

RESOLUTION NO. 74F-2

Not adopted.

RESOLUTION NO. 74F-3

Relative Value Studies Committee

WHEREAS, The Committee on Relative Value Studies, after seven years, has now completed a new Relative Value Studies which may already have been mailed, or soon will be mailed, to every member, in a looseleaf folder. The Current Procedural Terminology Codes and Descriptions have been used and many procedures are listed which are not found in the 1966 edition; and

WHEREAS, Relationships between professional medical procedures are not constant and new discoveries are frequent so the Relative Value Studies need continual revision; therefore be it

Resolved, That the Relative Value Studies Committee be annually appointed with one member selected by each of the recognized specialty societies who have delegates to the House of Delegates and with such other members as may be selected by the President; and be it further

Resolved, That the Relative Value Studies Committee shall meet at the call of the chairman but at least once between annual sessions of the Society; and be it further

Resolved, That the Kansas Relative Value Studies shall be the official nomenclature, the official identifying numbers, and shall be the official point relationships of the Kansas Medical Society and the specialty societies of this state, and there shall be no alterations accepted for use within Kansas until they have been approved by the Relative Value Studies Committee of this Society.

RESOLUTION NO. F74-4

Executive Responsibility for Equitable RVS

WHEREAS, The functioning Kansas Relative Value Scale is weighted to favor some disciplines over others; and

WHEREAS, Third-party acceptance of the Relative Value Scale makes its terms vitally important to physicians of every discipline; therefore be it

Resolved, That the Kansas Medical Society develop a Relative Value Scale acceptable to the Executive Committee as equitable to all disciplines.

RESOLUTION NO. F74-5

Adjudication of Inequities

WHEREAS, No agency within the framework of the Kansas Medical Society now exists to amend the provisions of the Relative Value Scale as may prove inequitable now or in the future; therefore be it

Resolved, That the Relative Value Committee be empowered to consider and amend where necessary the provisions of the Relative Value Scale, subject to the approval of the Executive Committee; and be it further

Resolved, That the Committee be further authorized to review and grant adjustments in fees under previously published norms wherein an inequity has developed.

RESOLUTION NO. F74-6

Future Changes in RVS

WHEREAS, The economics of medicine have in the past been based on frightfully unsound and inequitable principles; and

WHEREAS, Any attempt to presently correct these previously defined inequities would lead to physician revolt; therefore be it

Resolved, That any future change in the Relative Value Schedule must be developed along the standards of:

1. Physicians time—the major determinant.
 2. Unusual skill.
 3. Postgraduate training.
 4. Cost of facilities and equipment to provide this service.
-

RESOLUTION NO. F74-7

Paramedical Personnel

(Not adopted. Held over for May.)

WHEREAS, Non-medical personnel may only perform services under the care of a licensed MD; therefore be it

Resolved, That:

1. Their services be compensated on the basis of their training, time, and skill.
 2. The MD overseeing their services be compensated only for the supervision and responsibility of these services.
 3. The sum of these two should never equal a similar service performed by an MD.
-

RESOLUTION NO. F74-8

Kansas Division of American Trauma Society

(Not adopted. Held over for May.)

WHEREAS, The American Trauma Society has emerged as a recognized national philanthropic organization dedicated to involve under medical guidance the lay public and lay leaders in a program of fund-raising, education and continuing involvement that will tend to supplement, support, and abet existing trauma programs and encourage the development of needed, but underdeveloped programs; and

WHEREAS, The national medical organizations such as the American College of Surgeons and the American Academy of Orthopedics have endorsed this organization; therefore be it

Resolved, That the Kansas Medical Society endorse the development of a Kansas Division of the American Trauma Society.

RESOLUTION NO. F74-9

Neurology

(Not adopted. Held over for May.)

WHEREAS, The Neurologists of Kansas wish to be recognized as a component organized specialty section of the Kansas Medical Society; therefore be it

Resolved, That the By-Laws be amended to add Section 4.58,17, "The Kansas Neurological Society."

RESOLUTION NO. 74F-10

Malpractice Committee

WHEREAS, Kansas physicians face an impending crisis in securing professional liability insurance; and

WHEREAS, Implementation of a deductible-self-insurance-conventional insurance concept will attract a stable underwriting market for Kansas physicians; and

WHEREAS, The Malpractice Committee has studied in depth the above proposal; therefore be it

Resolved, That the Malpractice Committee be authorized to:

- a. Obtain legal opinion and guidance in setting up such a program;
 - b. Proceed with feasibility studies through authorized insurance representatives;
 - c. Make a progress report to the House of Delegates in May.
-

RESOLUTION NO. 74F-11

Contraceptives for Minors

WHEREAS, Information which does not educate, and stimulation relating to sexual activity surrounds young people from many public media; and

WHEREAS, Most physicians in family oriented practices are aware of increased sexual activity on the part of adolescents; and

WHEREAS, It has been demonstrated in many studies that availability of contraception or its non-availability has no bearing on sexual activity; and

WHEREAS, There is statistical evidence of increased numbers of persons acquiring venereal diseases over the past several years; and

WHEREAS, There is statistical evidence to the effect that there are more fatalities among teenage females carrying a pregnancy to term than there are among female users of the various contraceptive measures; and

WHEREAS, The present statutes of the State of Kansas do not permit the free release of contraceptive informa-

tion and materials to minor persons even on request; and

WHEREAS, There is psychological and sociological trauma to participants and their families in the event of an unplanned adolescent pregnancy; therefore be it

Resolved, That the Kansas Medical Society take appropriate steps to request that the Kansas legislature will modify existing statutes so that minors may request and receive, without parental consent, from qualified health care delivery personnel, adequate information and medical services for contraception and venereal disease treatment and control; and be it further

Resolved, That the Kansas Medical Society request the legislature to so modify existing statutes that Kansas State Family Planning clinics funded by federal monies be allowed to furnish to minors on request, without parental consent, adequate information and medical services pertaining to contraception and venereal disease treatment and control.

RESOLUTION NO. 74F-12

Acupuncture

WHEREAS, Acupuncture is a newly introduced and as yet unproven technique to medical practice in this country; and

WHEREAS, The greatest danger of acupuncture is its use for the symptomatic treatment of patients without adequate conventional diagnostic evaluation for remediable or curable diseases or conditions; and

WHEREAS, New and unproven techniques offer fertile ground for quacks and charlatans; and

WHEREAS, Chiropractic has been condemned by this Society as an unscientific cult; and

WHEREAS, Penetration of the skin is specifically forbidden the chiropractor in this state; therefore be it

Resolved, That the Kansas Medical Society make known its unwavering opposition to the resolution passed by the State Board of Healing Arts on August 17, 1974, which permits chiropractors to perform acupuncture, and which recognizes the sponsorship of acupuncture training programs by chiropractic organizations; and be it further

Resolved, That the State Board of Healing Arts be reminded that acupuncture is merely one of the many modalities in the physician's armamentarium and not a system unto itself, and, thus, to safeguard the people of Kansas from the abuse and misuse of this technique; and be it further

Resolved, That this resolution be conveyed to the State Board of Healing Arts and to the KMS Legislative Committee in the event legislative activity is necessary.

RESOLUTION NO. 74F-13

National Health Insurance

Resolved, That the Kansas Medical Society urges that the AMA and the NABSP and other selected interested health organizations meet, compromise, and resolve the solution for a National Health Insurance program for the United States, and that this be accomplished prior to January 1, 1975; and be it further

Resolved, That the AMA Delegates from Kansas prepare a suitable resolution on this subject and present it to the AMA Clinical Meeting in Portland, November 30-December 4, 1974.

RESOLUTION NO. 74F-14

Collective Bargaining

(Not adopted. Held over for May.)

WHEREAS, There is an increasing involvement by the federal government in the delivery of health care; and

WHEREAS, This may be detrimental for the physicians in their delivery of excellent medical care for the people in Kansas; and

WHEREAS, These Kansas physicians may not have anything to say about how they are to be involved in these government programs; therefore be it

Resolved, That an active committee be formed under the Commission for Sociology and Economics to study the feasibility of collective bargaining.

RESOLUTION NO. 74F-15

Foundation Approval

WHEREAS, The Corporate Body of the Kansas Foundation for Medical Care has strongly endorsed KFMC Resolution No. 1, stating that the KFMC represents Kansas physicians for the purpose of peer review; and

WHEREAS, The Corporate Body requested that KFMC apply to be designated the conditional PSRO for the state of Kansas; therefore be it

Resolved, That this House of Delegates endorse the action taken by KFMC Corporate Body.

The Journal of the
KANSAS MEDICAL SOCIETY

INDEX TO VOLUME LXXV

JANUARY, 1974, TO DECEMBER, 1974, INCLUSIVE

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Kansas Foundation for Medical Care

(Continued from page 374)

the Foundation becoming a collective bargaining agent for the physicians of Kansas. Dr. Collins replied that this would be a possible future consideration, but that at the present time the Foundation must concern itself with implementing the PSRO law in Kansas.

There being no further questions, Dr. Collins thanked the members for their attendance and adjourned the meeting.

UNIVERSITY OF KANSAS MEDICAL CENTER POSTGRADUATE MEDICAL EDUCATION

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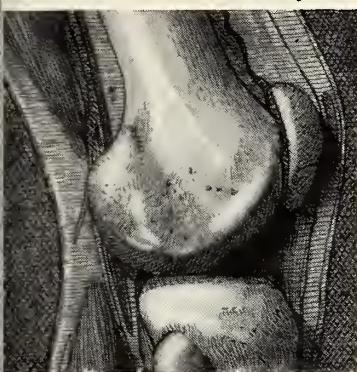
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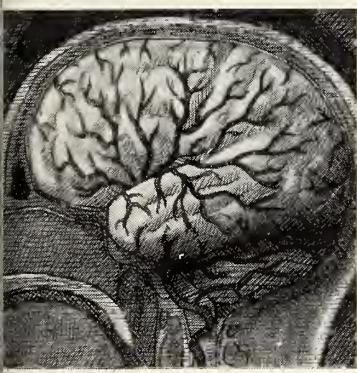
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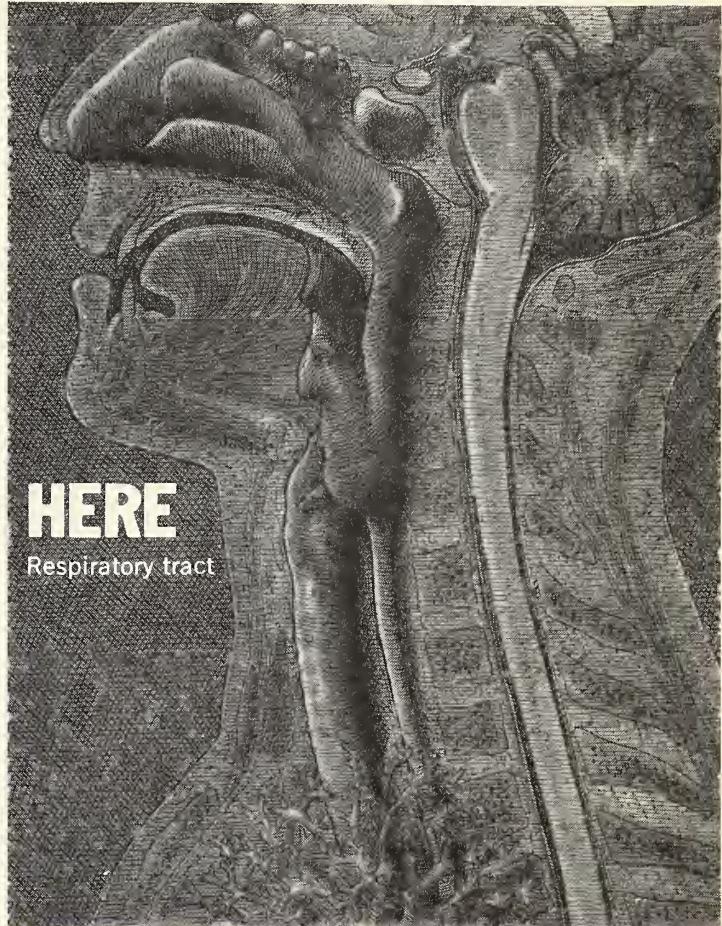
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The Role of the Detail Man

Dr. Willard Gobbell
Family Physician
Encino, California



Dr. Jeremiah Stamler
Chairman
Department of Community
Health and Preventive
Medicine, and Dingman
Professor of Cardiology
Northwestern University
Medical School



"I may be prejudiced, but I am very much in favor of the detail men I meet. Most of them are knowledgeable about the drugs they promote and can be a great help in acquainting me with new medication."

Family Physician's Perception

I think that most general practitioners in this area feel as I do about the detail man. Over the years I have gotten to know most of the men who visit me regularly and they in turn have become aware of my particular interests and the nature of my practice. They, therefore, limit their discussion as much as possible to the areas of interest to me. Since I usually see the same representative again in future visits, it is in his best interest to supply me with the most honest, factual, as well as up-to-date information about his products.

"In the total picture of dealing with health problems in this country there is a potential for detail men to play a meaningful role."

The Positive Influence

My contact with representatives and salesmen of the pharmaceutical industry is the type of contact that people in a medical center, research people, and academic people have and that's in all likelihood on a somewhat different level from that of the practicing physician.

Let me touch on how I personally perceive the role of the sales representative. These men reach large numbers of health professionals. Thus they could be—and at times actually are—disseminators of useful information. They could consistently serve a real educational function in their ability to discuss their products.

At present they do distribute printed material, brochures and pamphlets—some of it scientifically sound and therefore truly useful—as well as some excellent films produced by the pharmaceutical industry. When they function in this

Is He a Source of Information?

Yes, with certain reservations, the average sales representative is a great fund of information about the drug products he is responsible for. He is usually able to answer most questions fully and intelligently. He can also supply reprints of articles that contain a great deal of information. Here, too, I exercise some caution. I usually accept most of the statements and opinions that I find in the papers and studies which come from the larger teaching facilities. This goes without saying that a physician should also rely on other sources for his information on pharmacology.

Training of Sales Representatives

Ideally, a candidate for the position as a sales representative of a pharmaceutical company should be a graduate pharmacist who has a questioning mind. I don't think this is possible in every case, and so it becomes the responsibility

of the pharmaceutical company to train these individuals comprehensively. It is of very great importance that the detail man's knowledge of the product he represents be constantly reviewed as well as updated. This phase of the sales representative's education should be a major responsibility of the medical department of the pharmaceutical company.

I am certain that most of these companies take special care to give their detail men a great deal of information about the products they produce—information about indications, contraindications, side effects and precautions. Yet, although most of the detail men are well informed, some, unfortunately, are not. It might be helpful if sales representatives were reassessed every few years to determine whether or not they are able to fulfill their important function. Incidentally, I feel the same way about periodic assessments of everyone

in the health care field, whether they be general practitioners, surgeons or salesmen.

Value of Sampling

I personally am in favor of limited sampling. I do not use sampling in order to perform clinical testing of a drug. I feel that drug testing should rightly be left to the pharmacology researcher and to the large teaching institutions where such testing can be done in a controlled environment.

I do not use samples as a "starter dose" for my patients. I do, however, find samples of drugs to be of value in that they permit me to see what the particular medication looks like. I get to see the various forms of the particular medication at first hand, and if it is in a liquid form I take the time to taste it. In that way I am able to give my patients more complete information about the particular medications that I prescribe for them.

Capacity they are indeed useful; particularly in the fact that they disseminate broadly based educational material and serve not just as "pushers" of their drugs.

The Other Side of the Coin

Obviously, the pharmaceutical companies are not producing all this material as a labor of love—they are in the business of selling products for profit. In this regard the ambitious and improperly motivated sales representative can exert a negative influence on the practicing physician, both by presenting a one-sided picture of his product, and by encouraging the practitioner to depend too heavily on drugs for his total therapy. In these ways, the salesman has often distorted objective reality and undermined his potential role as an educator.

The Industry Responsibility

Since the detail man must be an information resource as well as a representative of his particular pharmaceutical company, he should be carefully selected and

thoroughly trained. That training, however, must be an ongoing one. There must be a continuing battle within and with the pharmaceutical industry for high quality not only in the selection and training of its sales representatives, but also in the development of all of its promotional and educational material.

The industry must be ready to accept constructive as well as corrective criticism from experts in the field and consumer spokesmen, and be willing to accept independent peer review. The better educated and prepared the salesman is, the more medically accurate his materials, the better off the pharmaceutical industry, health professionals and the public—i.e., the patients—will be.

Physician Responsibility

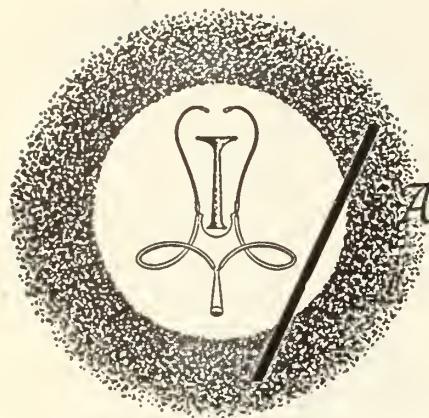
The practicing physician is in constant need of up-dated information on therapeutics, including drugs. He should and does make use of drug information and answers to specific questions supplied by the pharmaceutical representative. However, that informa-

tion must not be his main source of continuing education. The practitioner must keep up with what is current by making use of scientific journals, refresher courses, and information received at scientific meetings.

The practicing physician not only has the right, but has the responsibility to demand that the pharmaceutical company and its representatives supply a high level of valid and useful information. I feel certain that if such a high level is demanded by the physician as well as the public, this demand will be met by an alert and concerned pharmaceutical industry.

From my experience, my impression is that sectors of the pharmaceutical industry are indeed ethical. I challenge the industry as a whole to live up to that word in its finest sense.





Announcements

Professional meetings, conferences, and postgraduate courses of national importance are listed for the DOCTOR'S CALENDAR. Notice of the session is posted in advance to allow the physician time to make preparations.

JANUARY

- Jan. 2-7 Pediatric Nephrology Seminar, Americana Hotel, Bal Harbor, Florida. Write: Dept. of Pediatrics, University of Miami School of Medicine, PO Box 520875 Biscayne Annex, Miami 33152.

FEBRUARY

- Feb. 12 6th Annual Arthur E. Hertzler Memorial Lectures, The Hertzler Research Foundation, Halstead, Kansas.

- Feb. 21-22 Pediatric Behavior Management, Miami. Write: Dept. of Pediatrics, University of Miami School of Medicine, PO Box 520875 Biscayne Annex, Miami 33152.

- Feb. 27-
Mar. 1 Central Surgical Association, Drake Hotel, Chicago. Write: A. J. Walt, M.D., 540 E. Canfield, Detroit 48201.

MARCH

- Mar. 6-9 Student American Medical Association, Palmer House, Chicago. Write: C. C. Hewitt, J.D., 1400 Hicks Rd., Rolling Meadows, Ill. 60008.

- Mar. 14-16 National Medicolegal Symposium, Grand Hotel, Las Vegas. Write: AMA General Counsel, 535 N. Dearborn, Chicago 60610.

- Mar. 20-21 National Conference on Rural Health, Hotel Roanoke, Roanoke, Va. Write: B. L. Bible, Ph.D., 535 N. Dearborn, Chicago 60610.

APRIL

- Apr. 17-20 Missouri State Medical Association annual meeting, Chase-Park Plaza, St. Louis. Write: Ray McIntyre, 113 Madison St., Jefferson City 65101.

- Apr. 16-19 American Pediatric Society, Hilton, Denver. Write: C. D. Cook, M.D., Yale U. School of Medicine, New Haven, Conn. 06510.

Apr. 28-May 1 Aerospace Medical Association, San Francisco Hilton, San Francisco. Write: M. H. Goodwin, M.D., Washington National Airport, Washington, D.C. 20001.

University of Kansas Postgraduate Education:

Jan. 23-24	<i>Gyn-Ob</i>
Feb. 12-14	<i>Diagnostic Cytology</i>
Feb. 26	<i>The Mentally Handicapped Child</i>
Mar. 12-14	<i>Pediatrics</i>
Mar. 24-26	<i>Surgery</i>
Apr. 7-9	<i>Ophthalmology</i>
Apr. 10-11	<i>Emergency Nursing Care</i>
Apr. 16-17	<i>Family Practice</i>
Apr. 18	<i>Infectious Diseases</i>
Apr. 21-23	<i>Anesthesiology</i>
May 8-9	<i>Cardiovascular Diseases</i>

Also see pages 365 and 384.

Journal on Microfilm

Microfilmed copies of current as well as all back issues of the JOURNAL are available through University Microfilm Services, a subsidiary of Xerox Corporation. The 35 mm film fits all standard viewers and provides the JOURNAL in miniature at a savings on binding and storage costs. Write for information or send orders direct to University Microfilm Services, 300 North Zeeb Road, Ann Arbor, Michigan 48106.

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Month in Washington

The Health, Education and Welfare Department has issued final regulations on benefits and structure of Health Maintenance Organizations (HMOs), giving the green light to federal grants launching the program.

The regulations set forth the rules, restrictions, and benefits that must be followed in order for organizations to qualify as HMOs and receive federal aid. The \$325 million HMO program was approved by Congress in 1973. Grants can now be made among the 125 groups that have applied for funds to conduct feasibility studies, planning, and development.

The HMO Act authorizes federal support for five years "to demonstrate more broadly the concept of organizations delivering comprehensive health care services on a prepaid basis." Last year, Congress appropriated \$61 million. The Administration sought \$60 million this year, but the Senate approved only \$18 million because of a delay due to the development of the complicated regulations.

The regulations specify basic services to be provided in return for fixed payments made on a periodic basis without regard to the frequency, extent or kind of services provided, with the payments set on a community rating system. These may be supplemented by what the regulations call "nominal co-payments," limited under a variety of formulas.

Before the HMO program can be launched still more regulations will have to be completed. The most important is the statutory requirement that employers with more than 25 workers offer the employees the option of joining a qualified HMO if one is available. These proposed regulations are slated to be issued soon, but final ones are some months off.

Though suggestions were made to exempt HMOs from Professional Standards Review Organization (PSRO) authority, HEW rejected them, declaring that there is a need "to assure that suitable procedures are applied to HMO services to assure they conform to appropriate professional standards for the provision of health care applicable to other providers."

Basic HMO benefits must include:

- physicians services (including consultant and referral services by a physician);
- outpatient services and inpatient hospital services;
- medically necessary outpatient and inpatient emergency health services;
- short-term (not to exceed 20 visits), outpatient evaluative and crisis intervention mental health services;
- medical treatment and referral services (including referral services to appropriate ancillary services) for the abuse of or addiction to alcohol and drugs;

—diagnostic laboratory and diagnostic and therapeutic radiologic services;

- home health services; and
- preventive health services (including voluntary family planning services, services for infertility, preventive dental care for children, and children's eye examinations conducted to determine the need for vision correction).

Physicians, patients, and fellow workers have reacted favorably to the Physician Assistants (PA) employed in a pilot experiment by Kaiser Foundation Health Plan, according to a report on the program. At present, seven PAs are on duty at Kaiser. The first was hired in 1970, a graduate of the Duke University PA program and a former military corpsman.

There was concern by some physicians and administrators, but "the greatest resistance came from the nursing department," writes Kaiser official Paul Lairson, M.D., in *Inquiry*, the Blue Cross Association magazine.

As the nurses began to work with the PA and learned from experience that there was more of an "equal relationship" with him than with the physicians, they became a "traditional team," Dr. Lairson declared. Furthermore, "all but one of the physicians who worked in the clinic with the PA came to favor expanding the program," he said.

The PA saw approximately twenty patients per day at the Vancouver, Washington, clinic. He was given three physical examination appointments, and the rest of his time was rapidly filled with the "treatment of rela-

(Continued on page 17)

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Information for Authors

Manuscript Preparation

Manuscripts must be typewritten, double spaced, leaving wide margins. Submit the original, plus one copy if possible.

Titles should be short, specific, and amenable to indexing. A subtitle is frequently used to keep the main title short.

Summary: All manuscripts should include a short abstract which is a factual (not descriptive) summary of the work.

Author Responsibility: The author is responsible for all statements made in his work, including changes made by the copy editor. Manuscripts are received with the explicit understanding that they are not simultaneously under consideration by any other publication. Publication elsewhere will be subsequently authorized at the discretion of the Editor.

Galley Proof: To make extensive changes in the article after the text has been set in type may require an additional cost which exceeds the original. The galley proof is for correction of ERRORS, and a rewriting of the article should be done on the original copy BEFORE it is submitted for publication.

Drugs should be called by their generic names; the trade names can be added in parentheses if they are considered important. All units of measure must be given in the metric system.

References

Bibliographic references should not exceed 20 in number, documenting key publications. Personal communications and unpublished data should not be included. References should be arranged according to the order of citation, and not alphabetically. All references must be numbered consecutively and all must be cited in the text. Use the style of the AMA publications, giving; name of author, title of article, name of periodical, volume, pages, year.

Illustrations

All material which cannot be set in type, such as photographs, line drawings, graphs, charts, tracings (for preparation of tables, see below) must be mounted on white cardboard. All must be identified on the back as to figure number, author's name, and an arrow indicating top. Legends should be typed double spaced on a separate sheet of paper, limited to a maximum of 30 words.

Drawings and graphs should be done professionally in India ink on illustration board or high grade white drawing paper.

Photographic material should be submitted in duplicate as high-contrast, glossy prints. Color illustrations will be accepted for publication only if the author assumes the cost.

THE JOURNAL will assume the cost of B/W engravings and cuts up to \$35 (or 5 cuts). Engraving cost for illustrations in excess of \$35 will be billed to the author.

Tables

Because tables are set by hand, their cost is comparable to illustrations. A reasonable number of tables are allowed without cost to the author.

Tables should be self-explanatory and should supplement, not duplicate, the text. Since the purpose of a table is to compare or classify related items, the data must be logically and clearly organized. The relationship and comparison are established by the correct choice of column heads (captions of vertical columns) and stubs (left entries in horizontal listings).

Each table should be typed double spaced, including all headings, on separate sheets of lettersize paper. Oversize paper should not be used. Instead, repeat heads and stubs on a second sheet for tables requiring extra width. Number tables consecutively. Each table must have a title.

Reprints

A reprint order form with a table covering cost will be sent with the galley proof to each contributor. Since the JOURNAL has no way to provide for reprints, they must be ordered by the author and purchased directly from the printer.

PHYSICIAN, CHIEF OF MATERNAL AND CHILD HEALTH SERVICES: To assume responsibility for the maintenance and supervision of the Maternal and Child Health Program for a city-county health department now serving a population of approximately 400,000. Physician, licensed or eligible to practice medicine in Nebraska, Master of Public Health, or Board eligible in areas of Preventive Medicine or Pediatrics or equivalent graduate or resident training. Salary range \$29,100 to \$37,090, plus retirement and other fringe benefits. Contact

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Book Reviews

(Continued from page 8)

A textbook for future physicians should include technique as well as indications for such procedures as intubation and insertion of chest tubes, and there are many places where illustrations would be of value.

The book would be of value as a handbook or reference book for emergency room physicians, and in teaching paramedical personnel.

The reviewer showed the book to three interns, whose opinions he greatly respects. Two regarded the book inadequate, and one felt he would like the book because he had not had sufficient training in simple "First Aid." —Z.R.B.

MENSENDIECK YOUR POSTURE AND YOUR PAINS, by Ellen B. Lagerwerff and Karen A. Perlroth. Doubleday & Co., New York. 1973. 240 pages. \$7.95.

From the late 1800's until her death in 1957, Dr. Bess M. Mensendieck developed and taught her system of muscle education and maintenance designed to promote correct posture. This book is designed to introduce the uninitiated to the basic principles of her system. It is not intended to be a didactic classroom textbook but rather a book for personal practice.

This system depends on muscle education as opposed to massage and external modalities in the treatment and prevention of muscular aches and pains. It is entirely consistent with scientific principle. In view of these positive points, it is unfortunate that the authors claim that the system will prevent kyphoscoliosis (pg. 60) and flat feet (pg. 97). These claims cannot be substantiated.

An individual with a basic amount of self-discipline can, as the authors say, work his way through this book and be greatly rewarded with a sense of improved physical well-being.—M.A.A.

Letters to VOX DOX should be addressed to the Vox Dox Editor, Journal of the Kansas Medical Society, 1300 Topeka Avenue, Topeka, Kansas 66612.

BOOKSHELF

Books acknowledged in this section are available on loan from the Health Sciences Library, c/o Stormont-Vail Hospital, 10th & Washburn, Topeka, Kansas 66606.

ARTHRITIS, by Sheldon P. Blau, M.D. and Dodie Schultz. Doubleday & Co., Inc. 1974. 176 pages. \$5.95.

THE SOFT FOODS COOKBOOK, by Anne S. Chamberlain. Doubleday & Co., Inc. 1973. 130 pages. \$5.95.

THE ABORTION CONTROVERSY, 2nd Edition, by Betty Sarvis and Hyman Rodman. Columbia University Press. 1974. 207 pages.

HANDBOOK OF SURGERY, 5th Edition, by John L. Wilson, M.D., Editor. Lange Medical Publications. 1973. 877 pages. \$7.00.

THE ULTIMATE STRANGER: THE AUTISTIC CHILD, by Carl H. Delacato, Ed.D. Doubleday & Co., Inc. 1974. 226 pages. \$6.95.

THE BATTERED CHILD, 2nd Edition, by Ray E. Helfer and C. Henry Kampe, Editors. The University of Chicago Press. 1974. 262 pages. \$15.00.

REVIEW OF MEDICAL PHARMACOLOGY, 4th Edition, F. H. Meyers, M.D., E. Jawetz, M.D., and A. Goldfein, M.D., Editors. Lange Medical Publications. 1974. 721 pages. \$10.50.

NEW MEMBERS

The JOURNAL takes this opportunity to welcome these new members into the Kansas Medical Society.

J. A. Billingsley, Jr., M.D. 427 W. Main Gardner, Kansas 66030	Lloyd D. Hubler, M.D. 929 N. St. Francis Wichita, Kansas 67214
--	--

F. M. Garcia, M.D. 8100 Marty Overland Park, Ks. 66204	Jae M. Lee, M.D. 8100 Marty Overland Park, Ks. 66204
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Roberta G. Gilbert, M.D. 4121 West 83rd Prairie Village, Ks. 66207	L. A. Sawker, M.D. 8100 Marty Overland Park, Ks. 66204
--	--

Month in Washington

(Continued from page 14)

tively minor medical and surgical problems, whether by appointment or on a 'drop-in' basis." More severe or chronic problems were transferred to the internist or other specialist.

The tax reform bill before the House Ways and Means Committee has a provision to discourage professional conventions by American organizations in foreign countries.

Exempted would be Canada, Mexico, Bermuda, and the Caribbean. To secure a business expense deduction, the taxpayer must show that it was "more reasonable for the meeting to be held outside North America."

The amendment is aimed at national conventions being held in faraway tourist attractions where attendees deduct their travel and other expenses as business-connected.

HEW has announced that commencing with the first of the new year, the Medicare hospital deductible will jump to \$92. The present deductible is \$84. HEW said that the \$92 deductible is equivalent to the average cost of one day of hospitalization. The increased payment was brought about by rising hospital costs. The Medicare law requires an annual review of hospital costs under Medicare and an adjustment of the portion of the bill for which a Medicare beneficiary is responsible, if the costs have risen substantially.

When the hospital deductible amount changes, the law requires comparable changes in the dollar amounts that a Medicare beneficiary pays toward a hospital stay of more than 60 days, or an Extended Care Facility (ECF) stay of more than 20 days.

When a Medicare beneficiary has a hospital stay of more than 60 days, he will pay \$23 a day for the 61st through the 90th day, up from the present \$21 per day. If he has a posthospital stay of over 20 days in an ECF, he will pay \$11.50 per day toward the cost of the 21st day through the 100th day, up from the present \$10.50 per day.

If a beneficiary uses his "lifetime reserve" days, the extra 60 hospital days a beneficiary can use when he needs more than 90 days of hospital care in the same benefit period, will cost him \$46 for each reserve day used, instead of the present \$42 per day.

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